Natural Sciences and Engineering Research Council

2013–14

Departmental Performance Report

The Honourable James Moore, P.C., MP
Minister of Industry

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Catalogue Number: NS1-20/2014E-PDF
ISSN 2368-2019

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Foreword

Departmental Performance Reports are part of the Estimates family of documents. Estimates documents support appropriation acts, which specify the amounts and broad purposes for which funds can be spent by the government. The Estimates document family has three parts.

Part I (Government Expenditure Plan) provides an overview of federal spending.

Part II (Main Estimates) lists the financial resources required by individual departments, agencies and Crown corporations for the upcoming fiscal year.

Part III (Departmental Expenditure Plans) consists of two documents. Reports on Plans and Priorities (RPPs) are expenditure plans for each appropriated department and agency (excluding Crown corporations). They describe departmental priorities, strategic outcomes, programs, expected results and associated resource requirements, covering a three-year period beginning with the year indicated in the title of the report. Departmental Performance Reports (DPRs) are individual department and agency accounts of actual performance, for the most recently completed fiscal year, against the plans, priorities and expected results set out in their respective RPPs. DPRs inform parliamentarians and Canadians of the results achieved by government organizations for Canadians.

Additionally, Supplementary Estimates documents present information on spending requirements that were either not sufficiently developed in time for inclusion in the Main Estimates or were subsequently refined to account for developments in particular programs and services.

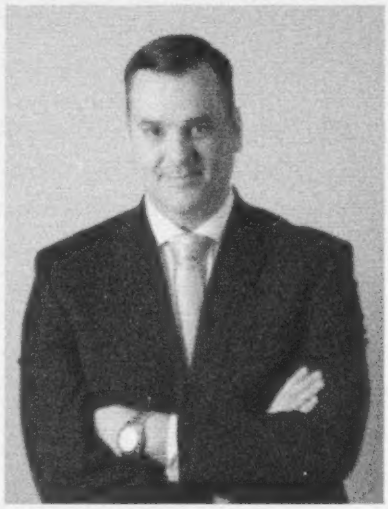
The financial information in DPRs is drawn directly from authorities presented in the Main Estimates and the planned spending information in RPPs. The financial information in DPRs is also consistent with information in the Public Accounts of Canada. The Public Accounts of Canada include the Government of Canada Consolidated Statement of Financial Position, the Consolidated Statement of Operations and Accumulated Deficit, the Consolidated Statement of Change in Net Debt, and the Consolidated Statement of Cash Flow, as well as details of financial operations segregated by ministerial portfolio for a given fiscal year. For the DPR, two types of financial information are drawn from the Public Accounts of Canada: authorities available for use by an appropriated organization for the fiscal year, and authorities used for that same fiscal year. The latter corresponds to actual spending as presented in the DPR.

The Treasury Board *Policy on Management, Resources and Results Structures* further strengthens the alignment of the performance information presented in DPRs, other Estimates documents and the Public Accounts of Canada. The policy establishes the Program Alignment

Architecture of appropriated organizations as the structure against which financial and non-financial performance information is provided for Estimates and parliamentary reporting. The same reporting structure applies irrespective of whether the organization is reporting in the Main Estimates, the RPP, the DPR or the Public Accounts of Canada.

A number of changes have been made to DPRs for 2013–14 to better support decisions on appropriations. Where applicable, DPRs now provide financial, human resources and performance information in Section II at the lowest level of the organization's Program Alignment Architecture.

In addition, the DPR's format and terminology have been revised to provide greater clarity, consistency and a strengthened emphasis on Estimates and Public Accounts information. As well, departmental reporting on the Federal Sustainable Development Strategy has been consolidated into a new supplementary information table posted on departmental websites. This new table brings together all of the components of the Departmental Sustainable Development Strategy formerly presented in DPRs and on departmental websites, including reporting on the Greening of Government Operations and Strategic Environmental Assessments. Section III of the report provides a link to the new table on the organization's website. Finally, definitions of terminology are now provided in an appendix.



Minister's Message

Canada has a long and proud history of excellence in research and discovery. As our country becomes more and more integrated into the globally competitive economy, harnessing the power of science, technology and innovation is key to the success of Canadian entrepreneurs and to the creation of jobs and prosperity for Canadians.

Industry Canada's portfolio partners continue to play central roles in promoting innovation, improving Canada's marketplace policies, and efficiently managing programs and services. From supporting experts in the field to youth in the classroom, the partners have maintained their commitment to fostering strong working partnerships and forging groundbreaking relationships.

In 2013–14, the Natural Sciences and Engineering Research Council of Canada (NSERC) continued to support Canadian leadership in science and engineering. Canada is ranked first among G7 countries for research and development support in our colleges, universities and other institutions. Across Canada and in all sectors of the economy, organizations and businesses benefited from post-secondary research and training through initiatives like the Strategy for Partnerships and Innovation.

Since being elected, our government has invested more than $11 billion in science, technology and innovation, and we will continue to support Canada's competitiveness in all sectors the economy through programs that encourage skills training.

As Industry Canada revises the federal science, technology and innovation strategy, it will work in partnership with NSERC to help shape Canada's international competitiveness by promoting our world-class research and discovery.

It is my pleasure to present the 2013–14 Departmental Performance Report for the Natural Sciences and Engineering Research Council of Canada.

James Moore
Minister of Industry

Minister of State's Message

A strong focus on science, technology and innovation has never been more important than in today's globally competitive environment. As Minister of State for Science and Technology, I am proud to be part of a government that has committed record investments in these disciplines to push the boundaries of knowledge and to create jobs and opportunities while improving the quality of life of Canadians.

By developing strong partnerships with Canadian businesses while leveraging public-private investments, the Natural Sciences and Engineering Research Council of Canada (NSERC) has distinguished itself as one of Canada's main drivers of innovation and scientific advancement.

In 2013–14, NSERC supported Canada's leadership in the natural sciences, technology, engineering and math fields for the social and economic benefit of all Canadians. NSERC continues to support developing, attracting and retaining talented, highly qualified people at Canada's colleges, universities and institutes through a suite of programs ranging from science summer camps for young Canadians to world-leading research chairs. NSERC is also helping Canada's researchers to push the boundaries of knowledge in discovery research through programs such as Discovery Grants while actively encouraging greater innovation through partnerships between post-secondary institutions and the private sector, particularly through the Networks of Centres of Excellence program.

Moving forward, we hope to build on these measures and further align the objectives of the Industry Portfolio with the Government's overarching goals of creating jobs and opportunities for Canadians. Together, we can create lasting partnerships to build a prosperous future for Canada.

It is my pleasure to join my colleague, the Honourable James Moore, Minister of Industry, in presenting the 2013–14 Departmental Performance Report for NSERC.

Ed Holder
Minister of State (Science and Technology)

Section I: Organizational Expenditure Overview

Organizational Profile

Minister:

- The Honourable James Moore, Minister of Industry
- The Honourable Ed Holder, Minister of State (Science and Technology)

Institutional Head:

- The Honourable James S. Edwards (Vice-President and Chair of Council)
- Janet Walden (Chief Operating Officer)

Ministerial Portfolio: Natural Sciences and Engineering Research Council of Canada

Enabling Instrument: *Natural Sciences and Engineering Research Council Act*[i]

Year of Incorporation: May 1, 1978

Organizational Context

Raison d'être

The Natural Sciences and Engineering Research Council of Canada (NSERC) is a key actor in making Canada a leading country of discovery and innovation. NSERC aims to maximize the value of public investments in research and development (R&D) and to advance the prosperity and quality of life of all Canadians.

In today's highly competitive global economy, NSERC plays a central role in supporting Canada's innovation ecosystem. NSERC supports research that benefits all Canadians. By connecting this innovative research to industry through its partnership initiatives, NSERC also makes it easier for the private sector to collaborate with academia and access the wealth of resources Canada's first-rate academic system has to offer.

Canada's future discoverers and innovators can realize their full potential with the support of NSERC's scholarships and fellowships programs, along with funding provided through discovery and partnership awards.

NSERC is also actively working to enhance the profile of Canadian research through national and international promotional activities and by connecting with industry.

Responsibilities

NSERC is a departmental corporation of the Government of Canada created in 1978. It is funded directly by Parliament and reports to it through the Minister of Industry. NSERC's Council is composed of a President and up to 18 other distinguished members selected from the private and public sectors. NSERC's President is the Chief Executive Officer.[1] The elected Vice-President is the Chair of the Council and of its Executive Committee. NSERC's Council is advised on policy

[1] The Chair of NSERC currently serves as President, with the Chief Operating Officer undertaking day-to-day functions, while a selection process is underway to determine the incoming President.

matters by various standing committees. Funding decisions are made by the President, or designate, on the basis of recommendations made by peer review committees. The functions of NSERC, based on the authority and responsibility assigned to it under the Natural Sciences and Engineering Research Council Act (1976-1977, c.24), are to:

- promote and assist research in the natural sciences and engineering, other than the health sciences; and
- advise the Minister in respect of such matters relating to such research as the Minister may refer to the Council for its consideration.

Strategic Outcome and Program Alignment Architecture

1.0 Canada is a world leader in advancing, connecting and applying new knowledge in natural sciences and engineering

1.1 **People: Research, Talent**

- 1.1.1 Science and Engineering Promotion
- 1.1.2 Scholarships and Fellowships
- 1.1.3 Alexander Graham Bell Canada Graduate Scholarships*
- 1.1.4 Vanier Canada Graduate Scholarships*
- 1.1.5 Banting Postdoctoral Fellowships*
- 1.1.6 Canada Research Chairs*
- 1.1.7 Canada Excellence Research Chairs*

1.2 **Discovery: Advancement of Knowledge**

- 1.2.1 Discovery Research
- 1.2.2 Research Equipment and Resources

1.3 **Innovation: Research Partnerships**

- 1.3.1 Research in Strategic Areas
- 1.3.2 Industry-driven Collaborative Research and Development
- 1.3.3 Networks of Centres of Excellence*
- 1.3.4 Training in Industry
- 1.3.5 Commercialization of Research*
- 1.3.6 College and Community Innovation*

1.4 **Internal Services**

*Programs involving more than one federal granting agency

Organizational Priorities

NSERC's role is to make strategic investments in people, discovery and innovation to increase Canada's scientific and technological capabilities for the benefit of all Canadians. NSERC invests in people by supporting postsecondary students, graduate students, researchers, and postdoctoral fellows in their advanced studies. NSERC promotes discovery by funding research conducted by postsecondary professors. NSERC fosters innovation by encouraging Canadian companies to participate and invest in postsecondary research and training. The vast majority of NSERC's expenditures are in areas that fall under the science and technology priorities established by the federal government.

Priority	Type	Strategic Outcome(s) [and/or] Program(s)
People Advantage	On-Going	Canada is a world leader in advancing, connecting and applying new knowledge in natural sciences and engineering

Summary of Progress

- In 2013-14 NSERC initiated the evaluation of its training initiatives, with the results to be made available in 2015. Following consultations on the Postdoctoral Fellowships program, procedures have been implemented to manage the application pressure caused by high demand for the program.
- In 2013-14, fifteen new Collaborative Research and Training Experience awards were granted to support professional skills development of trainees.
- In 2013-14, NSERC supported the Gender Summit 2013 in Washington, D.C. A multi-stakeholder roadmap for action was drafted which will be available in 2014.
- In 2013-14, the three federal granting agencies consulted the community on the harmonization of the Canada Graduate Scholarships Program, and implemented a fully harmonized application and review process for the Canada Graduate Scholarships-Master's Program.

Priority	Type	Strategic Outcome(s) [and/or] Program(s)
Knowledge Advantage	On-Going	Canada is a world leader in advancing, connecting and applying new knowledge in natural sciences and engineering

Summary of Progress

- In 2013-14, NSERC completed its evaluation of the Discovery Grants program. The evaluation concluded that the Discovery Grants Program is high performing, relevant and efficient. It also signalled that the revised peer review process has been successful and should be maintained with some minor refinements made to improve delivery and efficiency.
- In 2013-14, NSERC and SSHRC held an online consultation on the draft Tri-Agency Open Access Policy. A summary[ii] of the common themes raised in the online consultation and a full report[iii] on the consultation is available on the NSERC and SSHRC websites. NSERC, SSHRC, and CIHR are currently seeking final approvals for the adoption and implementation of a harmonized approach to the policy.
- In 2013-14, NSERC participated in the 2nd Annual Meeting of the Global Research Council and co-hosted the Americas Regional Meeting.
- In 2013-14, in partnership with Canadian and international research funding organizations, NSERC launched two calls for proposals on big data which were focused on the development of tools and techniques to better understand big data generated by multiple disciplines.

Priority	Type	Strategic Outcome(s) [and/or] Program(s)
Entrepreneurial Advantage	On-Going	Canada is a world leader in advancing, connecting and applying new knowledge in natural sciences and engineering

Summary of Progress

- In 2013-14, NSERC reduced the reporting burden for industrial partners with ongoing Collaborative Research and Development projects, a change which was strongly endorsed by the academic and industrial communities.

- In 2013-14, NSERC has continued to work with the National Research Council's Industrial Research Assistance Program to provide assistance in the implementation of the Concierge Service, a mechanism to assist Canadian enterprises to find information and guidance on how to access programs and resources which support business innovation.

- In 2013-14, sector outreach strategies were developed for key sectors of the Canadian economy to better connect and apply the R&D strengths of the post-secondary system to the R&D needs of industry. The strategies include reaching out to large Canadian R&D leaders who have the resources to collaborate with multiple universities on a variety of grant opportunities. Exploratory meetings have also been held with R&D facilitators with a sector focus. NSERC is also involved in discussions with federal departments who are planning investments in specific sectors.

- In 2013-14, an audit[iv] of the Networks of Centres of Excellence program and was completed and posted to the NSERC website. The audit found that the program performed positively in regards to the adjudication of applications and award payment. It also recommended completing a human resource and process efficiency analysis in addition to strengthening risk management and overall performance monitoring (against the program's objectives) of the program.

- In 2013-14, NSERC updated its research partnerships program literature to emphasize innovation skills. NSERC has communicated these revisions to the research and business community.

Priority	Type	Strategic Outcome(s) [and/or] Program(s)
Accountability	On-Going	Canada is a world leader in advancing, connecting and applying new knowledge in natural sciences and engineering

Summary of Progress

- In 2013-14, NSERC worked closely with the Social Sciences and Humanities Research Council and the Canadian Institutes of Health Research to successfully harmonize the Canada Graduate Scholarships – Master's as well as the gender and appeals process policies. NSERC also continues to work together with Social Sciences and Humanities Research Council to implement the new Research Portal and Canadian Common CV. This collaboration is designed to fulfill NSERC's commitments to harmonize and improve programs, activities and policies, in order to provide the highest level of service and accountability to the research community in Canada.

Priority	Type	Strategic Outcome(s) [and/or] Program(s)
Visibility	On-Going	Canada is a world leader in advancing, connecting and applying new knowledge in natural sciences and engineering

Summary of Progress

- In 2013-14, NSERC hosted Community Engagement Visits in May and June 2013, which involved senior management visiting 12 campuses across Canada and hosting webinars to gather feedback from the community on key programs and initiatives. These actions were taken to fulfill NSERC's commitment to build a more rigorous, systematic, consultative approach to connect with the research community, including the implementation of systematic, two-way communication channels.

- In partnerships with the Canada Science and Technology Museum, NSERC launched a new museum exhibit, "Data: New Ways of Seeing the World", in April 2014. The exhibit explores how NSERC-funded research into data visualization is making information more accessible and easier to understand.

- NSERC continues to participate in the Museum of Nature's travelling Water exhibit, which helps Canadians understand the challenges and innovative research happening around all aspects of water. The exhibit toured three venues across Canada in 2013-14: Kingston, Yellowknife and Medicine Hat.

Risk Analysis

Key Risks

Risk	Risk Response Strategy	Link to Program Alignment Architecture
Budget Management Risk The risk that the organization is ineffective in managing and monitoring the grants and operational budgets and in making informed/accurate resource related decisions.	NSERC is undergoing a multi-year initiative designed to address Budget Management Risks. In 2013-14 NSERC took the following steps to address this risk: • Prepared a more comprehensive corporate plan document to report the operational details for each division as a starting point for divisional work plans and performance management agreements • Focused attention to key corporate risks that guided planning and resource allocation for 2014-15 • Put in place the Research Portal Steering Committee to mitigate business transformation risk • Worked with the Social Sciences and Humanities Research Council to further align both	• Internal Services • People • Discovery • Innovation

	agencies' planning processes and tools • Developed three-year forecasting analysis and more comprehensive quarterly budget reports to guide planning • Revised the terms of reference of NSERC's management committees to support integrated planning	
Leveraging Information Technology Innovation The risk that the organization does not adequately leverage its investments in new technology to become more efficient and offer better services to the natural sciences and engineering community.	NSERC is undergoing a multi-year initiative to leverage Information Technology Innovation. In 2013-14, NSERC responded to this risk through the following actions: • Delivered NSERC's Discovery program activity, tri-agency Canada Graduate Scholarships and NSERC's Canadian Common CV using the Research Portal (the new grants management system)	• Internal Services • People • Discovery • Innovation

Actual Expenditures

Budgetary Financial Resources (millions of dollars)

2013–14 Main Estimates	2013–14 Planned Spending	2013–14 Total Authorities Available for Use	2013–14 Actual Spending (authorities used)	Difference (actual minus planned)
1,045	1,049	1,070	1,066	16.91

Human Resources (Full-Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
374	387	13[2]

Budgetary Performance Summary for Strategic Outcome and Program (millions of dollars)[3]

Strategic Outcome, Programs and Internal Services	2013–14 Main Estimates	2013–14 Planned Spending	2014–15 Planned Spending	2015–16 Planned Spending	2013–14 Total Authorities Available for Use	2013–14 Actual Spending	2012–13 Actual Spending	2011–12 Actual Spending
Strategic Outcome 1.0: Canada is a world leader in advancing, connecting and applying new knowledge in the natural sciences and engineering								
1.1 People: Research Talent	276.1	276.1	276.1	276.1	275.9	268.2	271.4	278.3
1.2 Discovery: Advancement of Knowledge	392.7	392.7	394.2	392.5	392.9	404.3	430.5	423.9
1.3 Innovation: Research Partnerships	352.6	357.3	363.1	368.2	375.4	370.1	346.9	358.4
Subtotal	1,021.3	1,026.0	1,039.3	1,036.8	1,044.2	1,042.6	1,048.8	1,060.7
Internal Services Subtotal	23.7	23.7	23.9	23.9	25.9	24.1	27.2	25.0
Total	**1,045.1**	**1,049.8**	**1,063.2**	**1,060.8**	**1,070.1**	**1,066.7**	**1,075.9**	**1,085.7**

[2] The variance in FTEs is explained by the receipt of additional funds through Budget 2013 and an increase in temporary staffing to deal with higher than expected demand during peak periods.

[3] Spending figures presented in this table may not match figures included in previous reports due to changes to NSERC's Program Alignment Architecture (PAA) that are being implemented for the first time in fiscal year 2013-14. These changes involve a reorganization of programs in NSERC's new PAA structure. NOTE: Planned spending for future years does not include investments announced in Budget 2013.

Alignment of Spending With the Whole-of-Government Framework

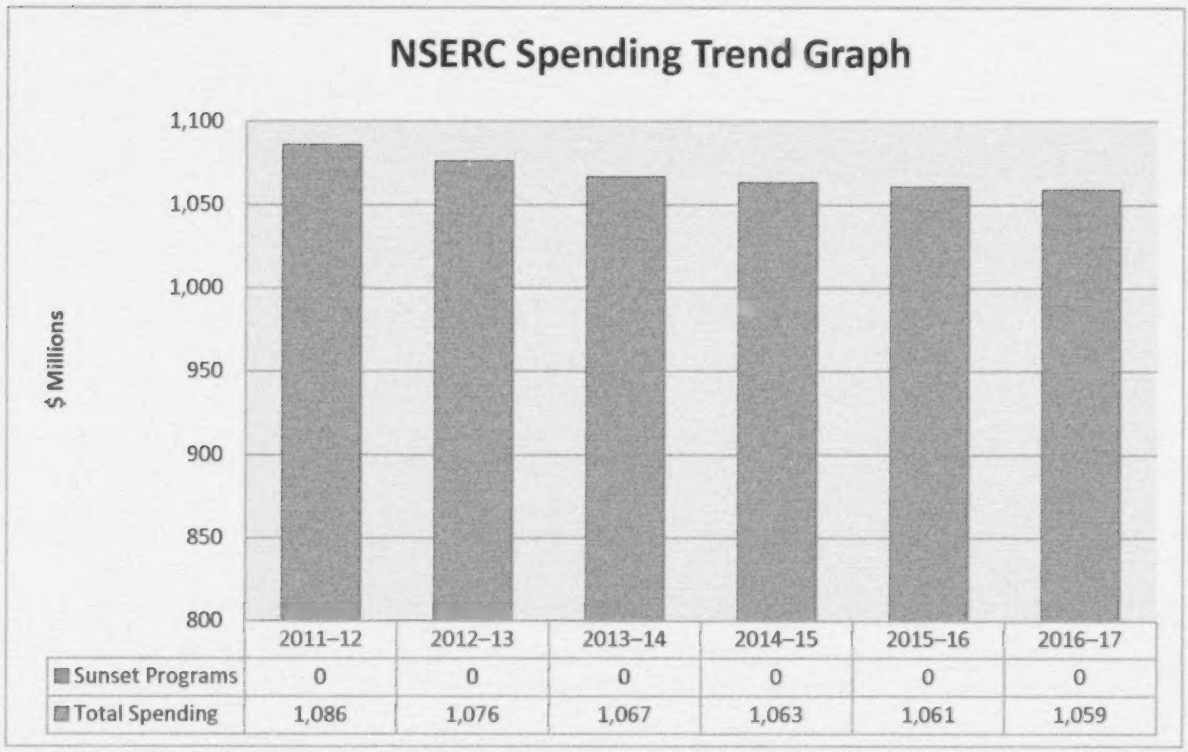
Alignment of 2013–14 Actual Spending With the Whole-of-Government Framework[v] (dollars)

Strategic Outcome	Program	Spending Area	Government of Canada Outcome	2013–14 Actual Spending
Strategic Outcome 1.0: Canada is a world leader in advancing, connecting and applying new knowledge in the natural sciences and engineering	1.1 People: Research Talent	Economic Affairs	An innovative and knowledge-based Economy	268.2
	1.2 Discovery: Advancement of Knowledge	Economic Affairs	An innovative and knowledge-based Economy	404.3
	1.3 Innovation: Research Partnerships	Economic Affairs	An innovative and knowledge-based Economy	370.1
Total				**1,042.6**

Total Spending by Spending Area (dollars)

Spending Area	Total Planned Spending	Total Actual Spending
Economic Affairs	**1,026.0**	**1,042.6**
Social Affairs		
International Affairs		
Government Affairs		

Departmental Spending Trend



	2011–12	2012–13	2013–14	2014–15	2015–16	2016–17
Sunset Programs	0	0	0	0	0	0
Total Spending	1,086	1,076	1,067	1,063	1,061	1,059

Note: Planned spending for future years does not reflect additional investments announced in Budget 2014 or future budget decisions.

Estimates by Vote

For information on NSERC's organizational Votes and statutory expenditures, consult the *Public Accounts of Canada 2014* on the Public Works and Government Services Canada website.[vi]

Section II: Analysis of Program(s) by Strategic Outcome

Strategic Outcome:

Canada is a world leader in advancing, connecting and applying new knowledge in natural sciences and engineering.

Program 1.1: People: Research, Talent

Description

This Program supports the attraction, retention and development of highly qualified people in the natural sciences and engineering in Canada through Chairs programs, fellowships, scholarships and stipends. These activities are essential to building the human capital required to enable a strong, globally competitive research and innovation system in Canada. Researchers, students and young people benefit from the grant funding which supports postsecondary university research as well as some outreach activities at universities, museums, science centres, and community-based organizations.

Budgetary Financial Resources (Millions of dollars)

2013–14 Main Estimates	2013–14 Planned Spending	2013–14 Total Authorities Available for Use	2013–14 Actual Spending (authorities used)	2013–14 Difference
276.1	276.1	275.9	268.2	-7.8[4]

Human Resources (Full-Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
33	37	4[5]

[4] Difference reflects funds redistributed to other NSERC programs.

[5] Increased FTEs were the result of the need to temporarily fill positions to address an unexpected workload and temporary job vacancies.

Performance Results

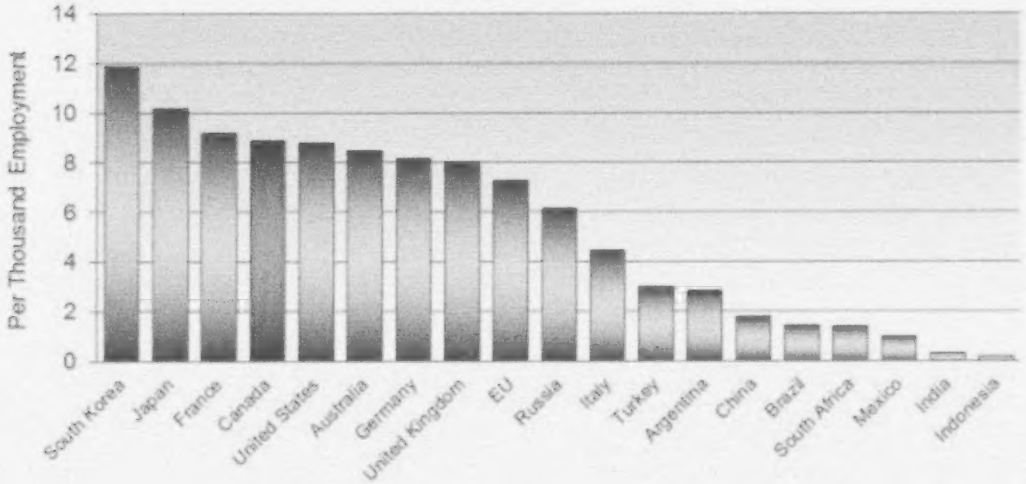
Expected Results	Performance Indicators	Targets	Actual Results
Canada's workforce has the required talented and skilled researchers in natural sciences and engineering.	Total researchers per thousand employed relative to G20 countries.	8th	4th (See Fig. 2.1)
	Percentage difference in unemployment rate for occupations in the natural sciences and engineering vs. national unemployment rate.	Greater than 1%	3.9% (See Fig. 2.2)
	Number of earned doctoral degrees in the natural sciences and engineering per capita vs. G20 countries	8th	6th (See Fig. 2.3)

Performance Analysis and Lessons Learned

Canada is performing well on the three indicators chosen to highlight NSERC's People: Research Talent investments. Canada ranks 4th in the total number of researchers per thousand employed relative to other G20 countries (Figure 2.1). While the unemployment rate for occupations in the natural sciences and engineering in 2013 is less than half the general unemployment rate, (Figure 2.2), at more than 1.2 million, the natural science and engineering labour force has also been the fastest growing occupational group in Canada over the past 20 years. Furthermore, the average annual salaries for natural sciences and engineering professions are 30% above the national average for all occupations. There has been steady growth in the number of earned doctorates produced by Canadian universities and this is reflected in improving international rankings. Canada now ranks 6th in the G20 in doctoral degree output per capita in the NSE for 2010. (see Figure 2.3)

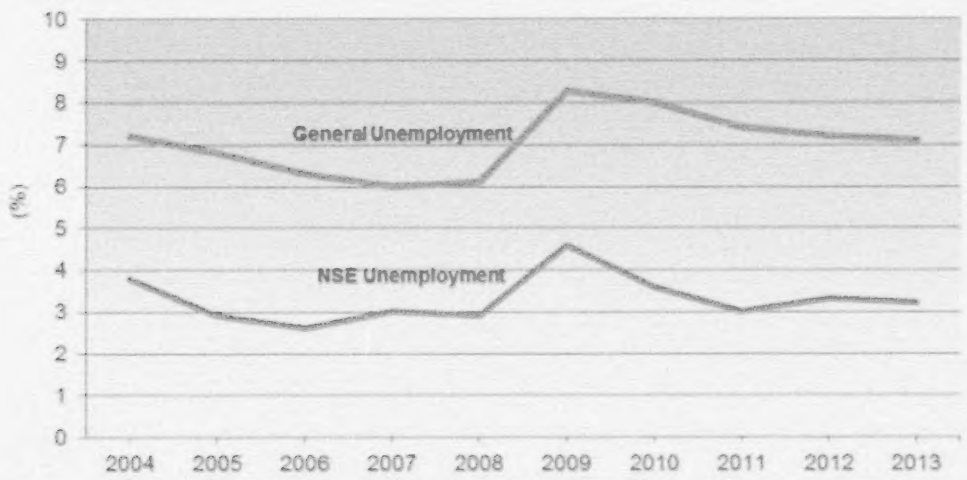
In 2013-14, the three federal granting agencies consulted the research community on the harmonization of the Canada Graduate Scholarships Program, and implemented a fully harmonized application and review process for the Canada Graduate Scholarships-Master's Program.

Figure 2.1
Number of Researchers Per Thousand Employment, G20 Countries, 2012 or Most Recent Year



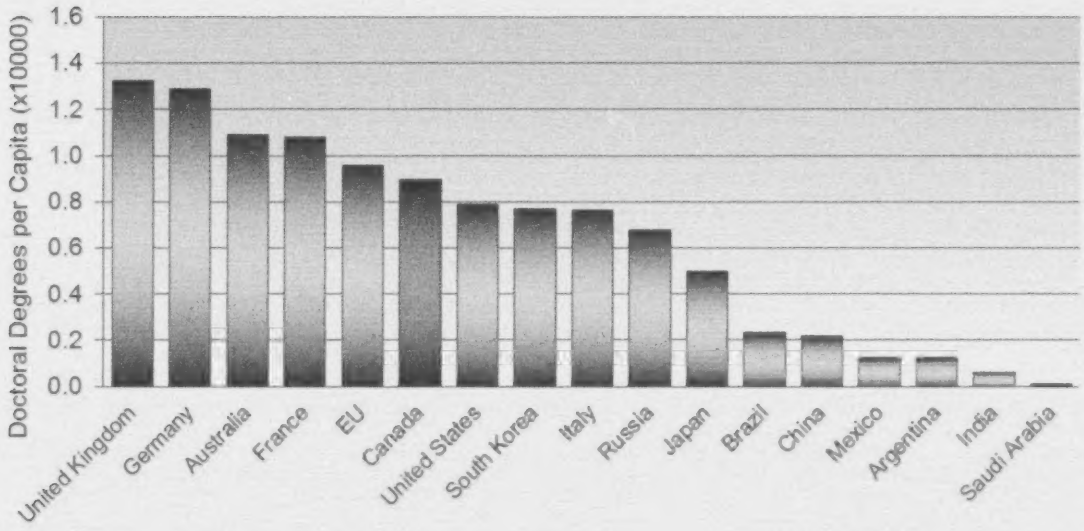
Source: OECD, UNESCO. Data not available for Saudi Arabia.

Figure 2.2
Unemployment Rates for General Population and Natural Scientists and Engineers (NSE)



Source: Statistics Canada.

Figure 2.3
Doctoral Degrees Granted per Capita, G20 Countries, 2010 or Most Recent Year



Source: National Science Foundation (U.S.), OECD. Data not available for Indonesia, South Africa and Turkey.

Sub-program 1.1.1: Science and Engineering Promotion

Sub-program Description:

This Sub-Program stimulates the public's interest in science, math, and engineering and encourages the next generation of students to consider careers in these fields, helping to ensure that Canada has an ongoing supply of future discoverers and innovators. These activities are necessary as Canada has fewer university students enrolled in the natural sciences and engineering disciplines, relative to most Organization for Economic Cooperation and Development countries. The Natural Sciences and Engineering Research Council awards grants to support activities of community-based organizations, museums, science centres and universities that stimulate the interest of young people and students and improve school performance in science and mathematics, notably groups that are under-represented in the Natural Sciences and Engineering, such as women and Aboriginals. In addition, the Natural Sciences and Engineering Research Council offers several prizes that recognize and highlight

Canadian achievements in training, research and innovation. This program uses funding from the following transfer payment(s): Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
6,419.8	6,071.9	-347.9[6]

Human Resources (Full-Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
2	2	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
The next generation of university students select the natural sciences and engineering as a field of study	Percentage growth in bachelor's enrolment in the NSE at Canadian universities.	1%	2.5% (see Figure 2.4)
	Percentage of science promotion projects that successfully complete the planned activity.	80%	90%

Performance Analysis and Lessons Learned

Bachelor's enrolment in the NSE is currently at an all-time high and grew by 2.5% in 2011-12 as compared to the previous year. Increasing participation of youth in university education, favourable demographics, and NSERC's PromoScience awards have all helped to push NSE bachelor's enrolment ever higher. End of grant reporting also indicates that 90% of

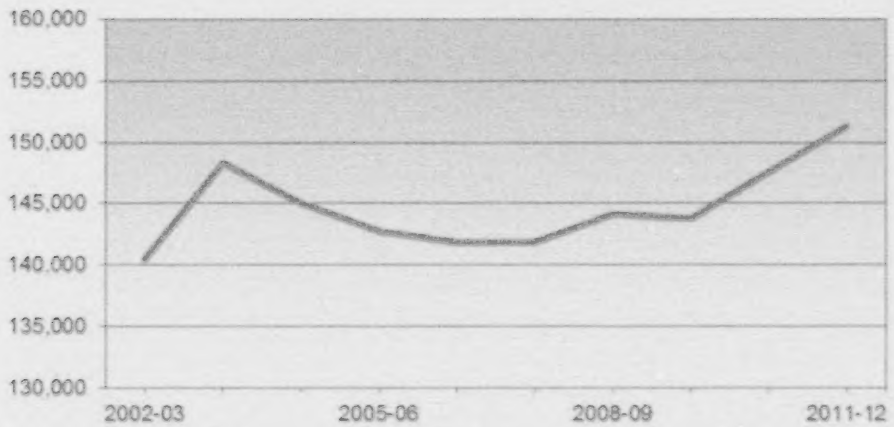
[6] Unspent funds caused by differences in planned vs actual spending were re-distributed to other NSERC programs.

PromoScience awards have been successful in meeting the expectations of the planned activities.

PromoScience continues to support organizations that promote the natural sciences and engineering to Canada's young people, with an increased emphasis on proposals focusing on groups that are traditionally under-represented in scientific and engineering careers. The 2013 PromoScience competition attracted 145 eligible applications, and 60 awards were made of which 5 grants were awarded to organizations that specifically focus their outreach to girls as well as 7 grants awarded to organizations that specifically focus their outreach to Aboriginal youth.

In November 2013, NSERC, the Canadian Institutes of Health Research, the National Science Foundation (US) and the National Institutes of Health (US) united to support the Gender Summit 2013 in Washington, D.C. More than 600 participants from academia, government and industry gathered to address gender issues in research and innovation. The Summit's objectives included conveying evidence that gender consideration is fueling excellence in research and innovation and drafting a multi-stakeholder roadmap for action, to be circulated broadly in 2014.

Figure 2.4
Bachelor's Enrolment in Canada in the Natural Sciences and Engineering



Source: Statistics Canada

Inspiring the Next Generation of Scientists and Engineers

2013 PromoScience Recipient: Let's Talk Science

Let's Talk Science is an exemplary organization that engages young Canadians in science, inspiring them to seek careers in science, technology, engineering and math fields. Founded and led by Bonnie Schmidt, this award-winning, non-profit organization inspires discovery in youth, from coast to coast, through science outreach programs. It also extends beyond outreach, offering other initiatives that enhance learning experiences. *CurioCity*, for example, provides interactive web-based resources for Grade 8-12 students and educators, while *IdeaPark* supports early learners. However, learning and skill development are only one part of the puzzle, *Let's Talk Science* also motivates and empowers youth to fulfill their potential by developing positive attitudes, critical skills and career awareness. The vision and continued success of *Let's Talk Science* has been recognized with *NSERC PromoScience* funding every year since 2000, granting a total of $1.6 million to the development of its science programs. This support will continue, as *Let's Talk Science* was awarded $150,000 annually over the next three years; one of the largest grants of this kind.

The Intergenerational Landed Learning Project

Farm-Based Education for Kids Wins 2013 Award for Science Promotion

In contrast to previous generations of Canadians, most young people today have little first-hand exposure to a working farm. Consequently, many children can grow up without understanding where their food comes from, the environmental and health consequences of their food choices and the challenges farmers face. This inspired the idea for the *Intergenerational Landed Learning Project*, winner of a 2013 Award for Science Promotion, that makes agricultural and food science accessible to the public. Based at a farm on the campus of the University of British Columbia, this dynamic initiative engages youth and adults of all walks of life in science. By uniting generations, not only is scientific interest being cultivated, but important community and ecological values are also being highlighted. Since its advent in 2002, the program has seen over 2,000 young people grow crops with 700 volunteer gardeners. This fresh mentorship approach to education has been adopted by other educators, and has inspired new community and school programs across Canada and internationally.

Sub-program 1.1.2: Scholarships and Fellowships

Sub-program Description:

This Sub-Program supports a significant number of students at various stages of their university studies. At the undergraduate level, support for 16-week research internships in universities aims to nurture and develop students' aptitudes towards research in the natural sciences and engineering and encourage them to undertake graduate studies and pursue a research career in these fields. At the postgraduate level, students earn a Master's or Doctoral degree in a domestic and/or foreign institution, after having spent time in an academic and/or industrial setting. The Council also supports the development of innovative training programs that encourage collaborative and integrative approaches, address significant scientific challenges associated to Canada's research priorities, include the acquisition of professional skills, and facilitate the transition of new researchers from trainees to productive employees in the Canadian workforce. Postdoctoral Fellowships provide support to promising Doctoral graduates to further their research training in Canada or abroad. This program uses funding from the following transfer payments Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending (authorities used)	2013–14 Difference
76,670.9	73,316.7	-3,354.2[7]

Human Resources (Full-Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
18	20	2[8]

[7] Difference reflects typical annual turnover in awards. Unspent funds were re-distributed internally to other NSERC programs.

[8] The variance in FTEs reflects additional investments announced in Budget 2013 and an increase in temporary staffing to facilitate higher demand during peak periods.

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Bachelors, Masters and Doctoral students gain research experience in natural sciences and engineering that provides them with a competitive advantage in their careers	Percentage of student population in the natural sciences and engineering supported (directly or indirectly) by NSERC.	25%	39%
	Percentage of students supported that are motivated to pursue further studies or training.	20%	26% (see Figure 2.5)
	Percentage of postgraduate students and postdoctoral fellows supported engaged in R&D in their jobs (7 to 9 years after their award).	50%	57%/93% (see Figure 2.6)

Performance Analysis and Lessons Learned

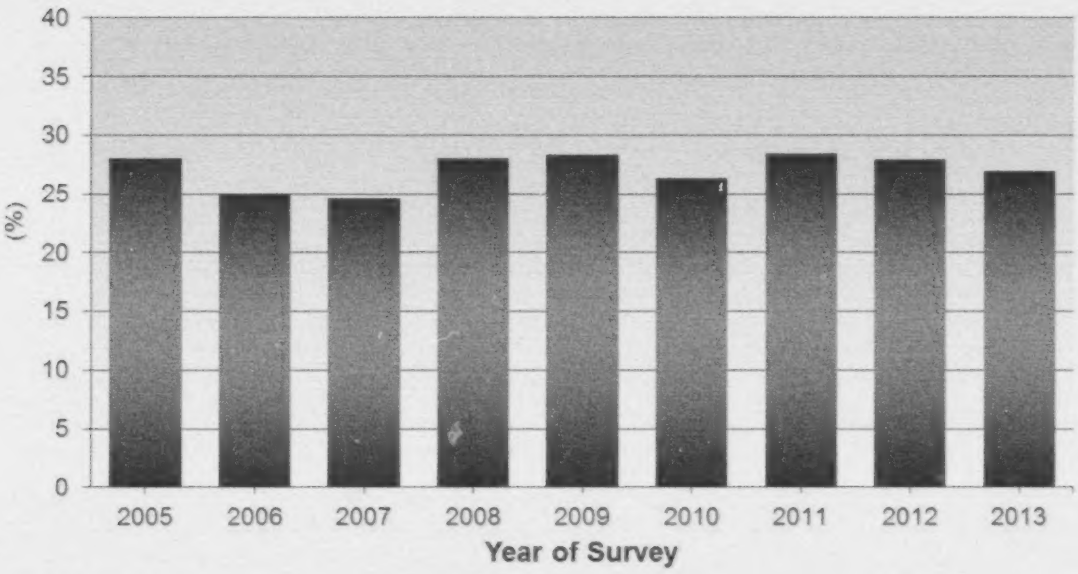
NSERC supports a significant proportion of the postgraduate students in the NSE in Canadian universities. In 2011-12, NSERC supported 17,500 master's and Ph.D. students compared to enrolment of 45,000 students (or 39% of the postgraduate student population). One way NSERC stimulates postgraduate enrolment in the NSE in Canada is by offering Undergraduate Student Research Awards that allow Canadian undergraduate students to gain work experience in a university lab. Post award exit surveys reveal that these recipients are highly motivated and 75% plan to pursue postgraduate education. The experience helped to encourage more than 25% of the recipients to consider postgraduate studies as compared to their intentions before the award (see Figure 2.5).

NSERC routinely surveys past scholarship winners (nine years after their award) and postdoctoral fellows (7 years after their award) to get a sense of their early career outcomes. Trained and educated for a career in R&D, former NSERC scholars (57%) and fellows (93%) are working in a R&D position (see Figure 2.6).

Other highlights for the year include:

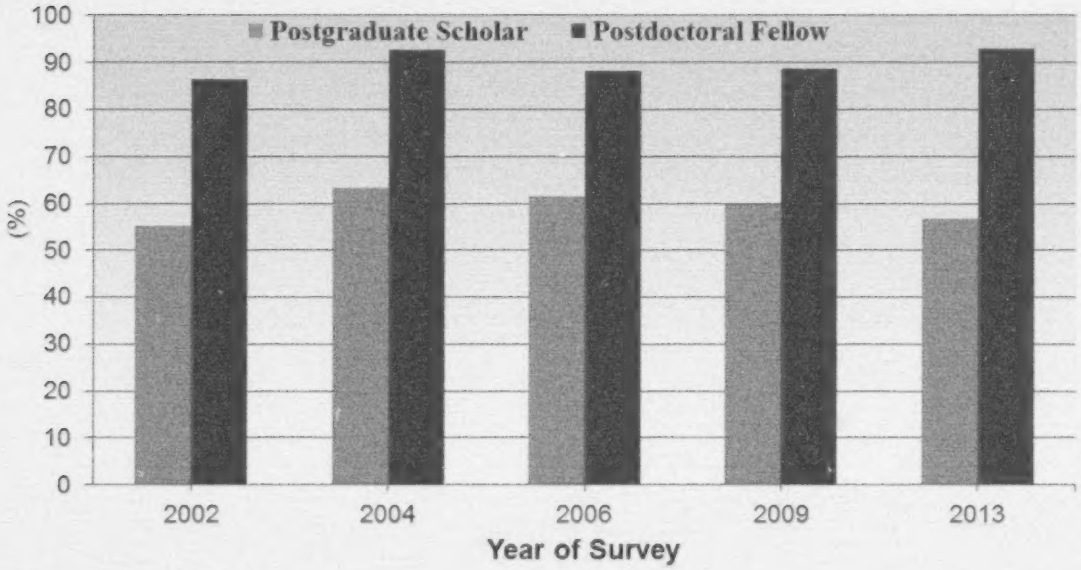
- In 2013-14 NSERC initiated the evaluation of its scholarships and fellowships training initiatives. The evaluation results will be available in 2015.
- Fifteen new Collaborative Research and Training Experience awards have been granted to support professional skills development of trainees, with a large portion including training in industrial settings as part of the industrial stream of this grant program. Six of these grants were awarded through strategic agreements established with funding agencies in Japan, Taiwan, France, Germany and Brazil.
- The Collaborative Research and Training Experience program is also included in the evaluation of the training initiatives initiated in 2013-14.

Figure 2.5
Percentage of NSERC Undergraduate Student Research Award (USRA) Holders Who Were Motivated to Pursue Postgraduate Studies



Source: NSERC University USRA exit surveys.

Figure 2.6
Percentage of Former NSERC Scholars (9 years after award) and Postdoctoral Fellows (7 years after award) Working in R&D



Source: NSERC Career surveys.

Sub-program 1.1.3: Alexander Graham Bell Canada Graduate Scholarships

Sub - Program Description

This Sub-Program provides financial support to outstanding eligible scholars pursuing Master's or Doctoral studies in a Canadian university. This program is necessary to ensure a reliable supply of highly qualified personnel to meet the needs of Canada's knowledge economy. Supplementary funding is available in the form of Foreign Study Supplements to select recipients of Canada Graduate Scholarships to build global linkages and international networks through the pursuit of exceptional, short-term research experiences at research institutions outside of Canada. This program uses funding from the following transfer payment: Canada Graduate Scholarships

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
43,109.0	43,187.2	78.2

Human Resources (Full-Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
10	12	2[9]

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Increased capacity to supply highly qualified personnel to the academic, public and private sectors	Percentage difference between students supported completing degrees vs. national average (a higher percentage indicates that more supported students complete their degrees	5%	9%
	Percentage difference between average time to degree completion among recipients vs. national average (a higher percentage indicates that recipients complete their degrees sooner).	5%	8%

NSERC's survey of former Canada Graduate scholars indicates that 99% of recipients completed their degree for which they received funding versus a national average completion rate of

[9] Variance in FTEs reflects an increase in temporary staffing to facilitate higher demand during peak periods.

90%.From the same survey it was also determined that recipients complete their doctoral degree in 4.8 years versus the national average of 5.2 years (Statistics Canada Earned Doctorate Survey), or 8% sooner.

- Following a consultation with the community, the delivery of the Canada Graduate Scholarship – Master's program component has been harmonized among the three granting agencies and the first awards delivered under the new process were made in April 2014. Planning has started for the harmonization of the Canada Graduate Scholarship-doctoral component.

Sub-program 1.1.4: Vanier Canada Graduate Scholarships

Sub - Program Description

This Sub-Program provides financial support to students who have achieved exceptional success in their studies and who demonstrate high potential in the pursuit of a doctoral program in a Canadian university. Both Canadian and international students are eligible for a Vanier Canada Graduate Scholarship. This program is necessary to attract and retain world-class doctoral students by supporting students who demonstrate a high standard of scholarly achievement in graduate studies, as well as leadership skills. A high-level steering committee, assisted by international review committees ensures that the best and brightest students are chosen as recipients of the scholarships. Awards allow students to fully concentrate on their studies and work with the best research mentors in their chosen field in Canada. This program uses funding from the following transfer payment: Vanier Canada Graduate Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
8,453.7	8,396.3	-57.4[10]

Human Resources (Full-Time Equivalents [FTEs])

[10] Difference reflects typical annual turnover in awards. Unspent funds were re-distributed internally to other NSERC programs

2013–14 Planned	2013–14 Actual	2013–14 Difference
2	2	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Contribute to making Canada a more attractive destination for top international students and making Canada's scholarship initiatives more internationally competitive	Ranking in the number of foreign graduate students per capita compared to G20.	10th	5th (see Figure 2.7)
	Percentage growth in the number of foreign students enrolled at the doctoral level in natural sciences and engineering programs in Canada.	2%	12% (see Figure 2.8)
	Percentage of foreign Vanier scholars remaining in Canada two years after their award.	25%	TBD[11]

Performance Analysis and Lessons Learned

As shown in Figure 2.7, Canada is an attractive destination for foreign students at the doctoral level (i.e. advanced research programs). The number of foreign doctoral students in the natural sciences and engineering enrolled at a Canadian university is at an all-time high and grew by more than 12% for the latest year-over-year period. At nearly 8,000 students, foreign natural sciences and engineering doctoral enrolment in Canada represents almost 40% of the student population at that level. Follow-up surveys have yet to be conducted to track the percentage of Vanier scholars staying in the country after their award.

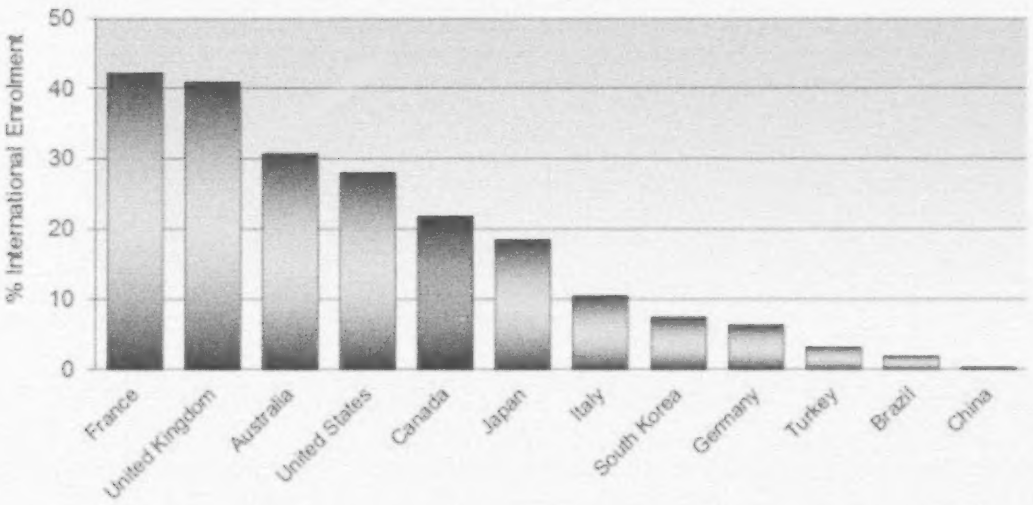
Other highlights for the year include:

[11] Results are expected upon completion of a survey of Vanier scholars in 2015-16.

- In September 2013, the government announced an investment of $34.5 million to support 166 Vanier scholars and 70 Banting fellows. Of the Vanier scholars, 56 are in the natural sciences and engineering and of the scholars, 21 are international researchers. Of the Banting fellows, NSERC supports 23 of which 6 are international researchers. These promising young researchers are positioned to become Canada's next generation of leaders in research excellence.

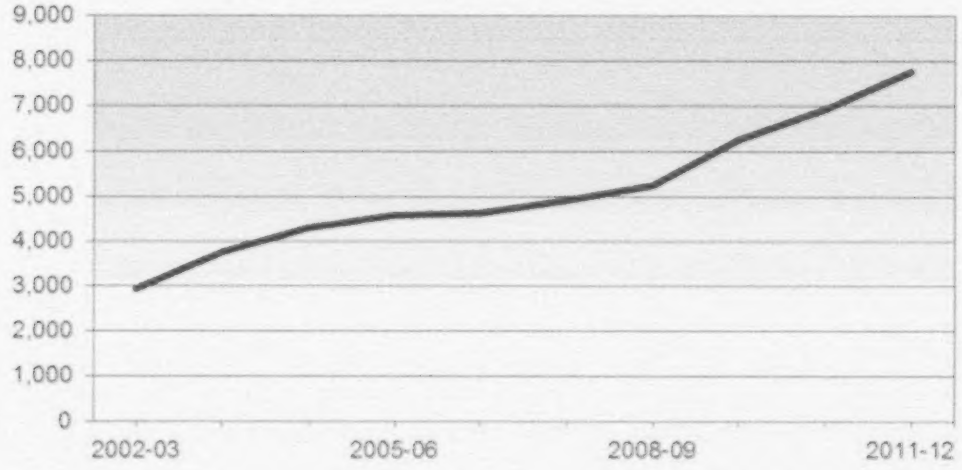
- In 2013-14, the Vanier Canada Graduate Scholarship programs underwent its first evaluation. Preliminary findings outlined that the program is achieving its two key main outcomes. Following the results of the program evaluation the Performance Measurement Strategy is currently being revised and is expected to be completed by March 2015.

Figure 2.7
International Students as a Percentage of Tertiary Education - Advanced Research Enrolment, G20 Countries, 2011 or Most Recent Year



Source: OECD. Data not available for Argentina, EU, India, Indonesia, Mexico, Russia, Saudi Arabia and South Africa.

Figure 2.8
Foreign Student Enrolment at the Doctoral Level in Canada in the Natural Sciences and Engineering



Source: Statistics Canada.

Sub-program 1.1.5: Banting Postdoctoral Fellowships

Sub - Program Description

This Sub-Program supports postdoctoral researchers from Canada and abroad in order to attract the very best postdoctoral fellows to further their training and carry out research in Canada. Up to 25% of these awards can be held abroad to allow Canadian postdoctoral fellows the opportunity to gain valuable international experience. This program helps reinforce Canada's standing as a global player in research excellence and higher learning and as a destination of choice for the most gifted students and researchers. The high level of support provided ensures that these fellowships are internationally competitive. Awards provide a two year stipend to the recipient. This program uses funding from the following transfer payments Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
3,307.6	3,293.6	-13.9[12]

Human Resources (Full-Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
1	1	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Contribute to making Canada a more attractive destination for word-class post-doctoral fellows	Percentage of applications from top 20 countries as measured by the quality of science and engineering publications.	25%	45% (see Figure 2.9)
	Percentage of fellows obtaining a research related position in Canada after their award.	35%	TBD[13]

Performance Analysis and Lessons Learned

Over the past four years the number of foreign applicants to the Banting Postdoctoral Fellowship program in the NSE has averaged 105. Nearly one-half of the foreign applicants come from the top 20 countries as ranked by the quality of their scientific and engineering publications (see Figure 2.9). The majority of the remaining foreign applicants are from Brazil, Russia, India and China. The number of fellows staying in Canada and having an R&D position will be determined in the next appropriate round of NSERC's career survey, a survey of former fellows seven years after their award.

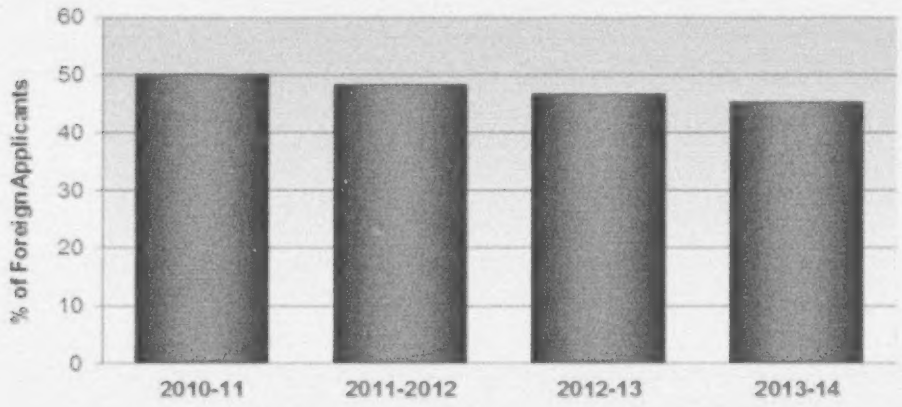
[12] Difference reflects funds redistributed to other NSERC programs

[13] Results are expected upon completion of a survey of Banting Fellows in 2015-16.

Other program highlights for the year include:

- The Performance Measurement Strategy for the program was approved in December 2013. The framework from this strategy will now form the basis for the annual reporting of the program performance and the periodic program evaluations. These will inform whether the candidates selected for Banting Fellowships meet the excellence requirements of the program and indeed go into successful research-related careers.
- The first evaluation of the program is in progress and is expected to be completed in 2015-2016.

Figure 2.9
Percentage of Foreign Applicants to the Banting Postdoctoral Fellowship Program from Top 20 Countries[1]



1. Top 20 countries as determined by the quality of their scientific and engineering publications.
Sources: NSERC and Observatoire des sciences et des technologies.

Sub-program 1.1.6: Canada Research Chairs

Sub - Program Description

This Sub-Program provides support to research chairs in the form of salary and research funding to attract and retain some of the world's most accomplished and promising minds. This program assists Canadian universities, together with their affiliated research institutes and hospitals, achieve the highest levels of research excellence and to become world-class research centres in today's global, knowledge-based economy. Eligible nominees are full professors or associate professors and emerging scholars who may range from recent Doctoral graduates to associate professors. National and international researchers can be chair holders. This program uses funding from the following transfer payments Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
119,679.7	115,488.9	-4,190.8[14]

Human Resources (Full-Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
0	0	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
World-class research capacity is enhanced at	Percentage of Chairs awarded to foreign researchers and expatriates.	20%	18.7%

[14] The variance between planned and actual spending reflects typical annual turnover of incumbents. Unspent funds were re-distributed internally to other NSERC programs.

Canadian universities through the attraction and retention of excellent researchers	Percentage of Chairholders staying in Canada.	98%	100%

Performance Analysis and Lessons Learned

Approximately one-fifth of Canada Research Chairs are held by foreign applicants recruited to Canada or by expatriate Canadians that were working abroad. As the program has matured, this percentage has fallen. In 2013-14, 100% of chair holders remained in the country during the tenure of their award. Chairs and other NSERC funding provide chair holders with substantial funding to conduct world class R&D. This funding is an important incentive for chair holders to stay in Canada. Of the 21 NSERC grantees that left the country in 2013-14, none were chairholders.

Other program highlights for the year include:

- The Canada Research Chairs Program continued to offer support which increased national and international scientific collaboration and which helped chairholders keep pace with other Canadian researchers. Through their institutional annual reports, 93 per cent of universities reported that the Chairs Program was important or very important to their ability to support the existing research centres and research clusters, and 81 per cent also indicated that the program was either important or very important to the creation of new research clusters and research centres.

Sub-program 1.1.7: Canada Excellence Research Chairs

Sub - program Description:

This Sub-Program offers eligible Canadian degree-granting institutions the opportunity to establish highly remunerated research chairs at their institutions in research areas of strategic importance to Canada, including but not limited to environmental sciences and technologies, natural resources and energy, health and related life sciences and technologies, and information and communication technologies, including the digital economy. This program is necessary to attract the highest calibre of researchers for Canada's future prosperity. This program uses funding from the following transfer payment: Canada Excellence Research Chairs.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
18,426.1	18,466.8	40.7

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
0	0	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
The attraction of the world's most accomplished researchers to help Canada build a critical mass of expertise in areas aligned with science and technology priority areas	Annual research funds leveraged by the CERC as a percentage of their award.	35%	181%

Performance Analysis and Lessons Learned

Canada Excellence Research Chair holders have been active in securing additional funding from a variety of sources, including NSERC and the Canada Foundation for Innovation. Several chair holders have been the lead on large Networks of Centres of Excellence and Canada Foundation for Innovation awards, generating a leverage ratio of almost double to that of their Chair award.

Other highlights for the year included:

- In 2013-14 the Chairs Secretariat followed on the Budget 2011 commitment to award 10 new Canada Excellence Research Chairs, by delivering phase 2 of the second competition. In this phase, nominations undergo a multilevel merit review process that includes evaluation by external experts, assessment by the review panel, strategic review by the selection board and final approval by the steering committee. As a result, in September 2013, Dr. Luda Diatchenko[vii] was appointed as Canada Excellence Research Chair in Human Pain Genetics at McGill University. This is the first woman appointed to a Canada Excellence Research Chair position.

- The first evaluation of the Canada Excellence Research Chairs program since its inception was initiated in 2013-14. Given the early stage of the program lifecycle, the evaluation scope is focused on key questions of relevance, performance, design and delivery helpful to Chairs management and staff for future program improvements and planning. In addition, the evaluation will focus on the assessment of program performance limited to immediate outcomes and operational efficiency. Results of the evaluation are expected in the fall of 2014.

Program 1.2 – Discovery: Advancement of Knowledge

Program Description:

This Program supports the creation of new knowledge and maintenance of a high quality Canadian broad-based research capacity in the natural sciences and engineering through grants to researchers. The advancement of knowledge generated by these grants is necessary to fuel a strong research and innovation system in Canada that is globally competitive. Academic researchers receive funding to carry out research, to support the timely acceleration of research programs, to purchase or develop research equipment, or to facilitate their effective access to major and unique research resources.

Budgetary Financial Resources (thousands of dollars)

2013–14 Main Estimates	2013–14 Planned Spending	2013-14 Total Authorities Available for Use	2013–14 Actual Spending	2013–14 Difference
392,703.5	392,703.5	392,895.8	404,299.5	11,595.9[15]

Human Resources (Full- Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
47	54	7

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Researchers at Canadian universities	Per capita output of publications in the natural sciences and engineering	2nd	2nd (see Figure 2.10)

[15] Spending differences reflect increased spending on research tools and instruments.

advance knowledge in the natural sciences and engineering.	vs. G20 countries.		
	Ranking in number of natural sciences and engineering publications vs. G20 countries.	9th	11th (see Figure 2.11)
	Average Relative Citation Factor for Canadian publications in the natural sciences and engineering vs. G20 countries.	6th	7th (see Figure 2.12)

Performance Analysis and Lessons Learned

One measure of university research is a publication in a scientific or engineering journal. Publications are a good indicator of the immediate outcome of NSERC research funding and can be used to benchmark our performance against the rest of the world.

Canadian researcher publication productivity is very high and the country ranks 2nd in the G20 on the per capita output of publications in the NSE (see Figure 2.10). Canada ranks 11th in the overall number of publications produced in the past year (see Figure 2.11).

The high quality and impact of Canadian research is evident in its ranking among top countries on the average number of times Canadian R&D publications are cited by other researchers. Citations are a measure of the potential use of a researcher's work by other researchers.

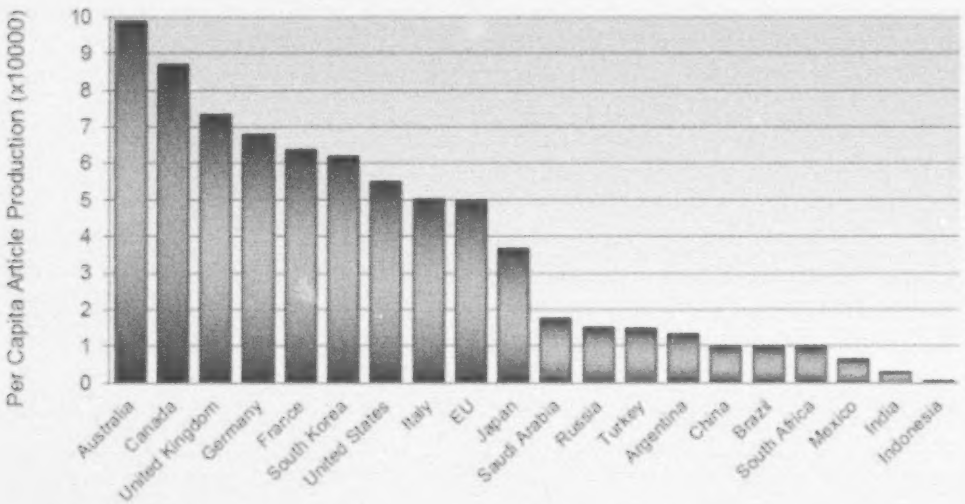
Based on the number of citations received by scientific papers over the three years following the publication year, a standardized measure called the Average Relative Citation factor is calculated for each country and international comparisons made. Based on the most current data available (2012), Canada sits in 7th position (see Figure 2.12).

Other highlights for 2013-14 include:

- NSERC continues to develop international partnerships with fellow international research funding agencies to facilitate international research collaborations designed to provide Canadian researchers with the skills required to work internationally. In 2013-14, NSERC participated in the 2nd Annual Meeting of the Global Research Council and

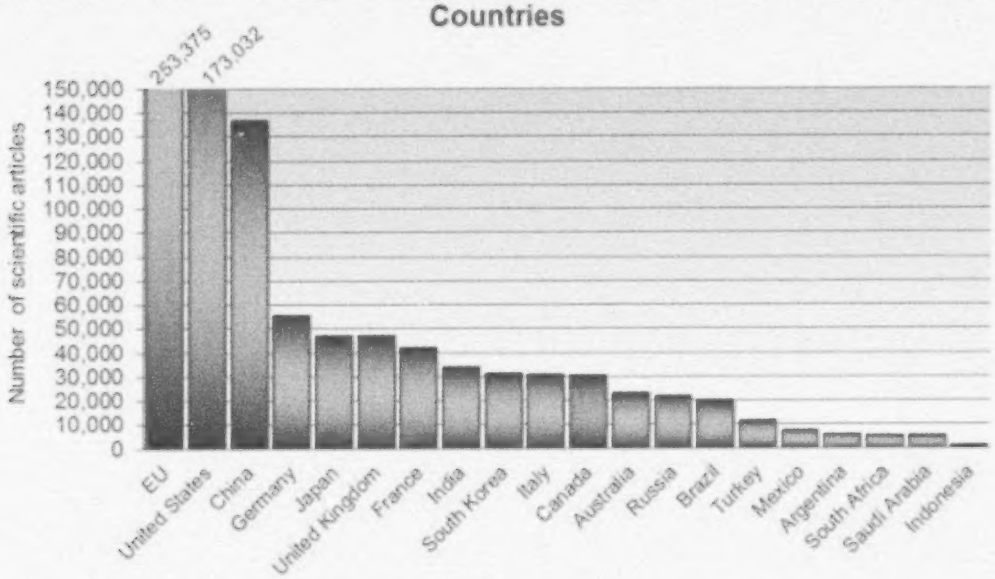
co-hosted the Americas Regional Meeting along with Chile's National Commission for Scientific and Technological Research. These global meetings enable international funding agencies to collaborate and share best practices on topics such as promoting research integrity, supporting future generations of researchers, and creating open access to research publications.

Figure 2.10
Natural Science and Engineering Article Production per Capita in the NSE, 2012, G20 Countries



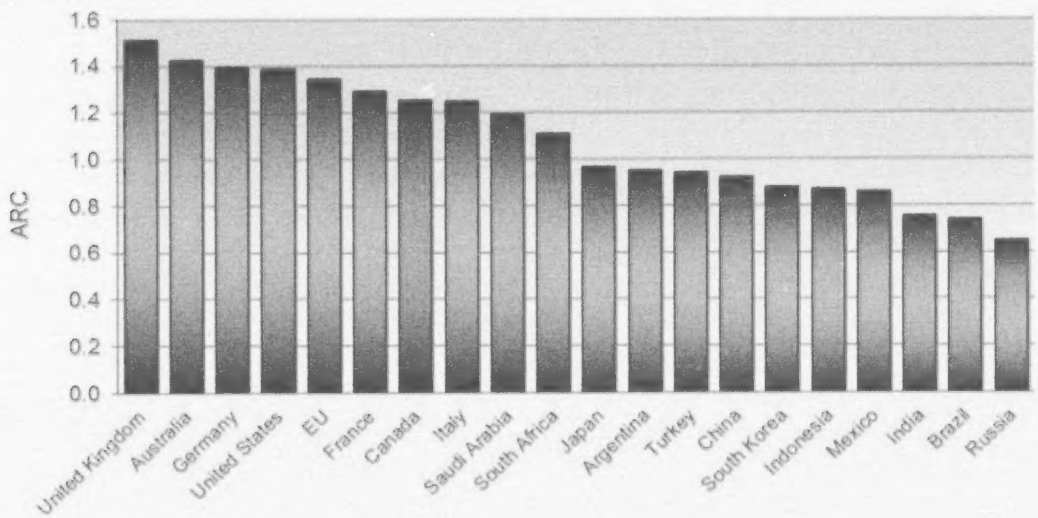
Source: Observatoire des sciences et des technologies

Figure 2.11
Natural Science and Engineering Article Production in the NSE, 2012, G20 Countries



Source: Observatoire des sciences et des technologies.

Figure 2.12
Average Relative Citation Factor (ARC) in the NSE, 2012, G20 Countries



Source: Observatoire des sciences et des technologies.

Sub-program 1.2.1: Discovery Research

Sub - program Description

This Sub-Program promotes and enables global excellence in discovery research in Canada. The Natural Sciences and Engineering Research Council`s discovery-based grants support long-term, ongoing programs of research as well as shorter-term research projects. The Council also offers substantial and timely additional resources to select researchers in order to accelerate progress and maximize the impact of their research program. In addition, the Council supports a limited number of large international activities, opportunities, or projects that are of high priority in the context of advanced research in Canada. These are led by world-class Canadian researchers and comprise teams that will generate substantial impact for the benefit of Canada. Having a solid capacity for basic research across a broad spectrum of natural sciences and engineering disciplines is necessary to ensure that Canada remains at the leading edge of knowledge creation. It ensures that Canada can access and exploit science and technology developments from other countries, and forms the foundation for innovation and the training of the next generation of scientists and engineers. This program uses funding from the following transfer payment: Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
375,939.2	370,379.1	-5,560.1[16]

Human Resources (Full- Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
45	52	7[17]

Performance Results

[16] Difference reflects typical annual turnover and administration of awards. Unspent funds were re-distributed internally to other NSERC programs.

[17] Increased FTEs were the result of the need to temporarily fill positions to address an unexpected workload and temporary job vacancies.

Expected Results	Performance Indicators	Targets	Actual Results
The discovery, innovation and training capability of university researchers in natural sciences and engineering is enhanced by the provision of support for on-going programs of basic research.	Percentage of the Discovery Grants program budget spent on early career researchers.	10%	13.8%
	Percentage of funds spent on training students and postdoctoral fellows	35%	50.6% (see Figure 2.13)
	Percentage of Canadian publications in the natural sciences and engineering coauthored with foreign researchers.	40%	51.6% (see Figure 2.14)

Performance Analysis and Lessons Learned

The Discovery Grants program provides funding to early career researchers to kick start their research at Canadian universities. In 2013-14, nearly 13.8% of Discovery Grants program funding was awarded to early career researchers.

To be funded through Discovery Grants, researchers must demonstrate research excellence and high productivity, as well as contributions to the training of highly qualified people. Based on the most current data available (2012-13), 50.6% of the program's expenditures were spent on supporting the training of students at the undergraduate, masters, doctoral and postdoctoral levels, through stipends provided by NSERC-funded professors (see Figure 2.13).

Canada produces slightly more than 4% of the world's science and engineering publications. As such, it is important for Canadian researchers to access the latest knowledge and expertise from around the world. One indicator of this activity is the number of Canadian publications co-authored with foreign researchers. As shown in Figure 2.14, over one-half of Canadian publications in the NSE in 2012 had a foreign collaborator, and this percentage grew every year over the past decade.

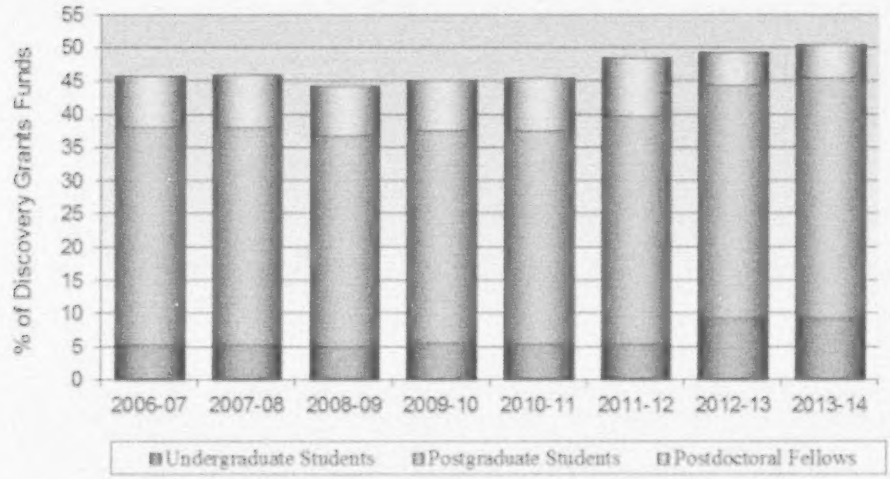
Other program highlights for the year include:

- NSERC continues to support a strong and dynamic base of researchers by recognizing and supporting excellence with the Discovery Grants Program. The 2013 competition awarded Discovery Grants to 281 early-career researchers and 1,716 established

researchers. The success rate (number of awards divided by the number of applications) for the 2013 competition was 59%.

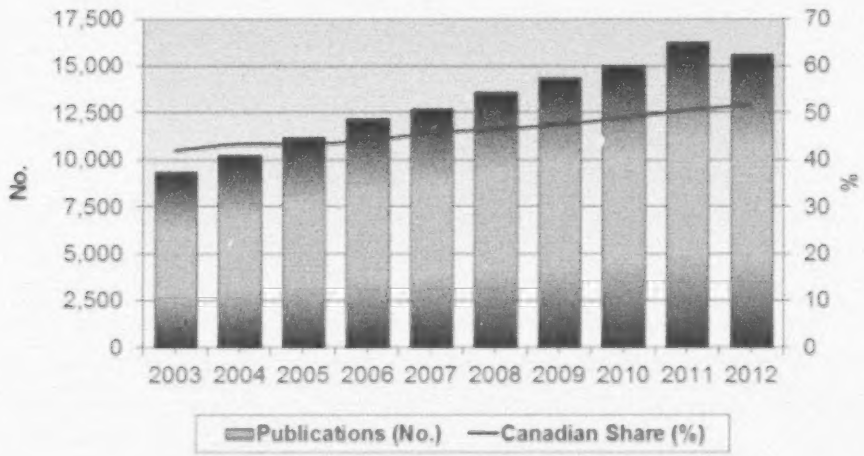
- In 2013-14, NSERC launched projects for the second Discovery Frontiers competition on the theme of advancing big data in genomics research. In 2013, there were two calls for proposals in partnership with Canadian and international research funding organizations. The calls were focused on the development of tools and techniques to better understand big data generated by a wide range of disciplines. One of the proposals, *Advancing Big Data Science in Genomics Research*, awarded one grant in March 2014 and was led by NSERC, in partnership with Genome Canada, the Canadian Institutes of Health Research and the Canada Foundation for Innovation. NSERC's contribution to the project will be $3,099,861 over 4 years. The second proposal, *Digging into Data Challenge,* was sponsored by 10 leading funders from four countries (Canada, the Netherlands, the United Kingdom and the United States). NSERC will contribute $330,750 over two years to this proposal. In February 2014, fourteen international teams received grants to investigate how computational techniques can be applied to "big data". Three of the funded teams included members who will be funded by NSERC.

Figure 2.13
Percentage of Discovery Grants Funds Used to Support Students and Fellows



Source: NSERC database.

Figure 2.14
Number of Internationally Co-authored Canadian Publications in the NSE and Share of Canadian Total



Source: Observatoire des sciences et des technologies

Evaluation of the Discovery Grants Program

In 2013-14, the International Review Panel completed the five-year evaluation of the Discovery Grants program. The report outlining the findings is available on NSERC's website.

The Panel concluded that the Discovery Grants Program is high performing, relevant and efficient and that it continues to be Canada's most crucial support mechanism for broad-based research in the natural sciences and engineering. The Panel also recognized the DG Program for its role in supporting the next generation of scientists who will help ensure Canada's prosperity in the future.

Nature's High-Performance Green Material
Expanding the Wood Fibre Market through Discovery Research

Cellulose nanocrystals, the basic ingredients in wood that makes it strong, have unique properties, which make them useful as greener additives in a wide array of consumer products, from paint and cosmetics, to airplanes and car parts. Until recently, no one had produced more than a handful of this natural, renewable, biodegradable, non-toxic nanomaterial; now, production is done by the ton. This is largely thanks to the research of Dr. Derek Gray and his team at McGill University. They developed the initial extraction recipe and discovered the nanocrystals' unique optical properties. This discovery quickly progressed from the lab to a commercial product, and with partnering organizations, *FPInnovations* and *ArboraNano,* has also led to a new spin-off company called *CelluForce.* As more sectors turn to environmentally friendly raw materials such as these nanocrystals, Canada's forestry industry has gained a significant head start on other countries in this promising market.

Sub-program 1.2.2: Research Equipment and Resources

Sub - program Description

This Sub-Program supports the purchase or development of research equipment and the maintenance of unique research resources. Funds are also used to facilitate researchers' access to major and unique research resources in Canada and abroad. Grants are awarded through a competitive peer review process. This activity is necessary because, in addition to funds to carry out research, top scientists and engineers need state-of-the-art equipment and resources to conduct research at world-class levels. Access to equipment and resources plays an important role in attracting the best minds to Canada and keeping them here. This program uses funding from the following transfer payment: Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
16,764.3	33,920.3	17,156.0[18]

Human Resources (Full- Time Equivalents [FTEs])

2013–14 Planned	2013–14 Actual	2013–14 Difference
2	2	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
The discovery, innovation and training capability of university researchers in natural sciences and engineering is supported	Growth in number of users conducting research at supported facilities.	5%	17% (see Figure 2.15)

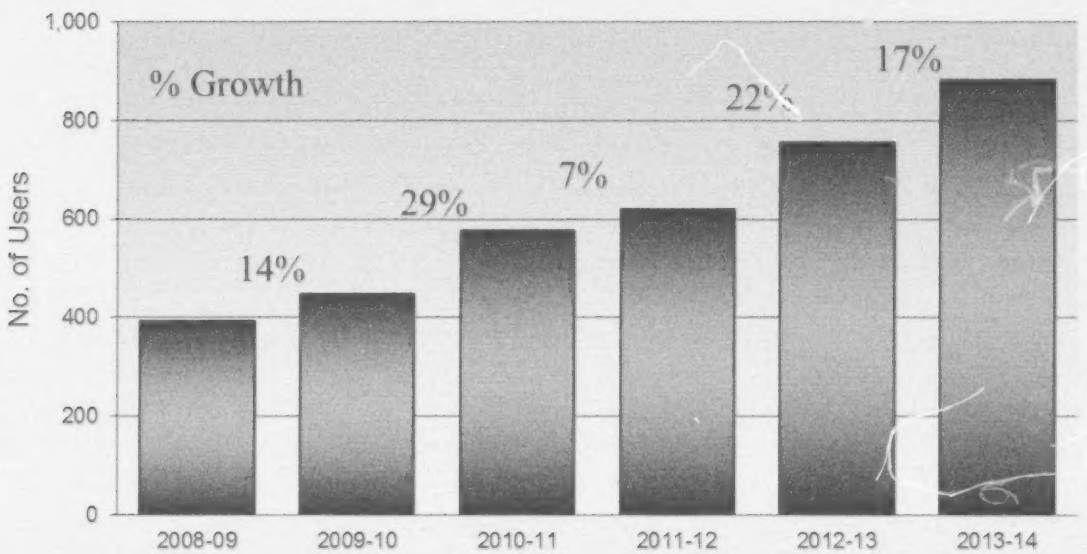
[18] Unused funds from other NSERC programs were transferred to Sub-Program 1.2.2 - Research Equipment and Resources resulting in higher than planned expenditures.

by access to research equipment and major regional or national research facilities	Average number of researchers benefiting from equipment awards	100	762 (see Figure 2.16)

Performance Analysis and Lessons Learned

A tracking of the annual number of users conducting research at NSERC supported facilities is presented in Figure 2.15. Over the past year there were 128 more users, a 17% growth compared to 2012-13.

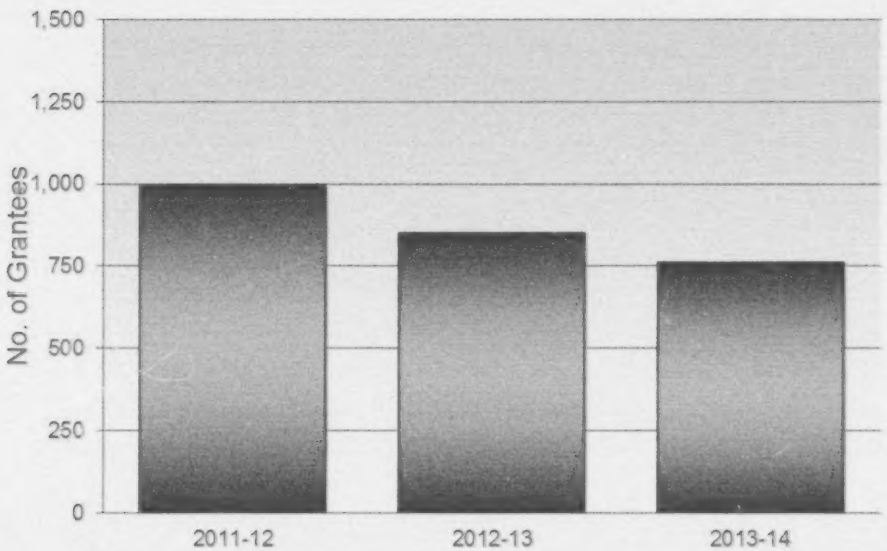
Figure 2.15
Number of users conducting research at supported facilities



Source: Canadian Light Source annual reports.

In 2013-14, 762 researchers benefited from an NSERC Research Tools and Instruments grant (see Figure 2.16). Based upon consultations with the research community in 2012-13, in 2013-2014, NSERC introduced a quota system to this program in order to reduce the burden of peer review on the community. Universities were provided with a quota of the number of applications that they could submit to NSERC for the Research Tools and Instruments grants.

Figure 2.16
Number of researchers benefiting from equipment awards



Source: NSERC database.

Program 1.3 – *Innovation: Research Partnerships*

Program Description:

This Program fosters partnerships in natural sciences and engineering that facilitates the transfer of knowledge and skills to the user sector through awards that support research projects and network activities intended for socioeconomic impact. The partnerships encouraged and enabled by these awards also increase the commercialization of Canada's research through new products, services and processes for the benefit of all Canadians.

Budgetary Financial Resources (thousands of dollars)

2013-14 Main Estimates	2013–14 Planned Spending	2013-14 Total Authorities Available for Use	2013–14 Actual Spending	2013–14 Difference
352,553.4	357,261.4	375,362.7	370,061.9	12,800.5[19]

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
119	121	2

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Canada builds more research partnerships between businesses, universities and colleges.	Growth in the number of business partners annually.	5%	8.4% (see Figure 2.17)
	Evidence of knowledge/technology transfer (new and/or improved products/services, enhanced skills/knowledge of partner personnel, invention disclosures,	Growth in the majority of indicators of knowledge/ technology	Growth in 5 of 9 indicators (see Figure 2.18)

[19] Increased spending a result of new funding for college programs

	university spin-offs, university licensing revenue, university R&D contract revenue, university patents).	transfer.	
	Growth in business enterprise funding of higher education research in the natural sciences and engineering.	2%	1.0% (see Figure 2.19)

In 2013-14, there was an 8% growth in the number of companies partnering with NSERC. Since the launch of the Strategy for Partnerships and Innovation in 2009-10, the number of industrial partners participating in NSERC programs has grown steadily every year and reached 3,102 in 2013-14 (Figure 2.17). The majority of the top 100 R&D firms in Canada are currently partners with NSERC. Industrial partners contribute financially to post-secondary research projects, scholarships and fellowships.

The Association of University Technology Managers currently conducts a survey of intellectual property commercialization in the North American university sector every year. The key results from the surveys are highlighted in Figure 2.18. There has been growth in 5 of the 9 indicators presented from 2007 - 2012, while the remaining indicators have been relatively stable for an overall positive outcome.

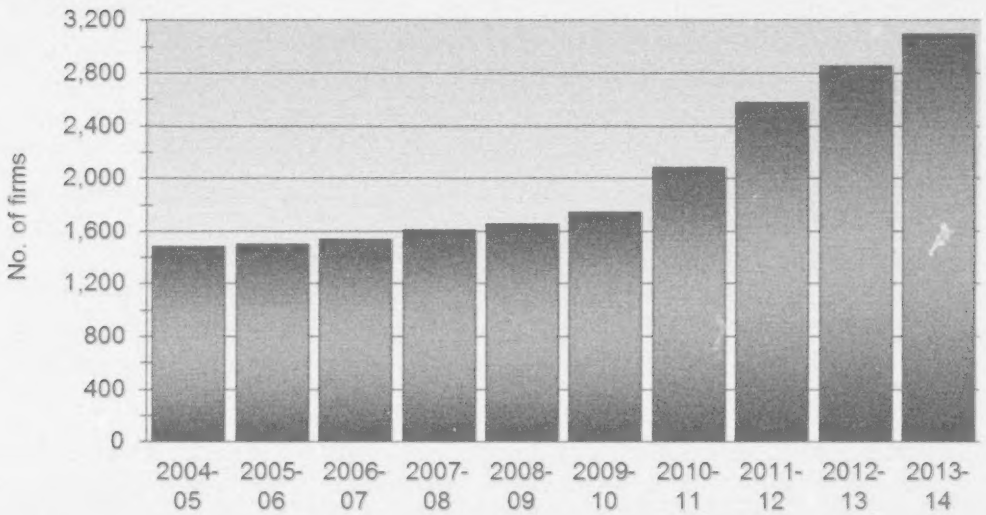
Canadian universities are very good at attracting funding from companies to conduct collaborative research of importance to the firm. While overall business R&D spending by Canadian firms has stagnated recently, since 2007 Canadian firms continue to increase their funding for university R&D (see Figure 2.19). This example of Canadian university-industry collaboration is one of the best in the G20.

Other highlights for the year include:

- In 2013-14, NSERC worked with the National Research Council's Industrial Research Assistance Program to assess and implement tools to link the expertise base within the NSERC systems with the new Concierge Service system being implemented under the leadership of the Industrial Research Assistance Program.

- In 2013 – 14, NSERC updated its research partnerships program literature to emphasize innovation skills. NSERC has communicated these revisions to the research and business community.

Figure 2.17
Number of Industrial Partners Participating in NSERC Programs



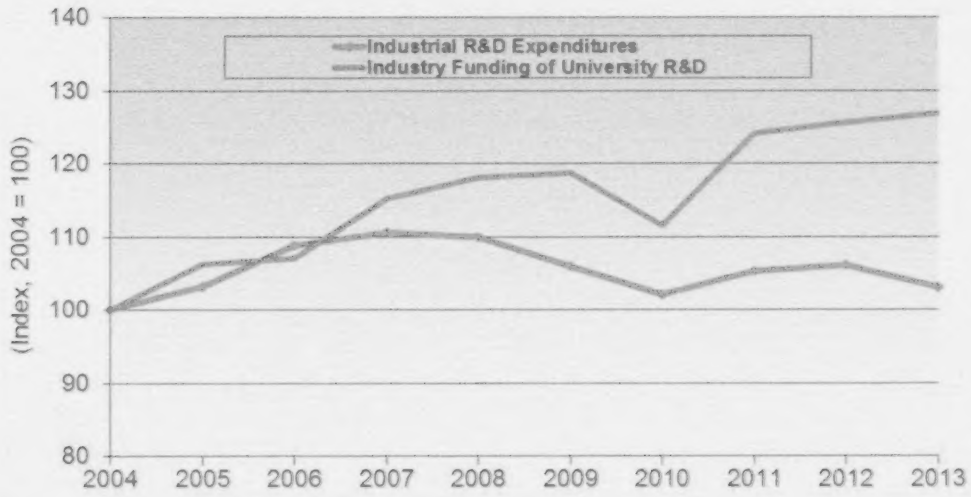
Source: NSERC database.

Figure 2.18
Canadian University[1] Intellectual Property Commercialization

Commercialization Activity	2007	2008	2009	2010	2011	2012
Invention disclosures	1636	1575	1723	1447	1554	1519
Patent applications filed	841	834	834	821	795	890
U.S. patents issued	155	102	106	124	153	155
Licenses executed	621	555	623	437	494	460
Cumulative active licenses	2849	2781	2846	2942	3090	3180
Royalties from licensing ($M)	$54.3	$49.3	$47.8	$50.3	$58.1	$63.9
Spin-off companies initiated	45	37	42	45	62	49
Spin-off companies still in business	602	593	572	604	649	578
Business contract R&D revenue ($M)[2]	$626	$643	$738	$657	$743	$728

Sources: Association of University Technology Managers (AUTM), Canadian Association of University Business Officers (CAUBO).
1. Sample of Canadian universities including: Alberta, British Columbia, Calgary, Dalhousie, Ecole de Technologie Superieure, Guelph, Laval, Manitoba, McGill, McMaster, Memorial, Montreal, Mount Allison, New Brunswick, Ottawa, Queen's, Saskatchewan, Sherbrooke, St. Mary's, Toronto, Waterloo, Western, Simon Fraser and Victoria.
2. Includes all Canadian universities.

Figure 2.19
Trends in Canadian Industrial R&D Expenditures and Industrial Funding of Canadian University R&D



Source: Statistics Canada.

Modelling Tools that Improve Vehicle Design
Dr. John McPhee, Synergy Award for Innovation Recipient in 2013

Dr. John McPhee from the University of Waterloo is one of Canada's leading modeling and control experts. Working collaboratively with MapleSoft and Toyota, his innovative modeling theories are leading to successful commercial products. One such example is MapleSim, a software package by Maplesoft, which allows engineers to reduce the development costs of new products and bring these to market faster. With thousands of licenses sold worldwide, the partnership is paying dividends and providing Maplesoft with a competitive edge. Toyota is also a beneficiary, as the automaker is finding more efficient ways to go from the design phase to the highway. Together, all three partners have helped to solve meaningful problems in the automotive field. This synergy has yielded new design tools for improved vehicle safety and comfort, and reduced fuel consumption and emissions. Now, this powerful partnership is looking to accelerate advances in green automotive technologies.

Sub-program 1.3.1: Research in Strategic Areas

Sub- program Description

This Sub-Program supports research projects and activities in selected areas of national importance and in emerging areas that are of potential significance to Canada. This program is necessary to take advantage of Canada's established excellence in research and innovation, and to build capacity in areas that are critical to the Canadian economy. Natural Sciences and Engineering Research Council invests in research areas that have been carefully selected as strategic priorities for the country. These investments support a range of activities such as research projects and networks. Funded activities share the common goal of connecting researchers with end users in order to enable the transfer of knowledge/technology and expertise that increases Canadian prosperity. This program uses funding from the following transfer payment: Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
98,885.6	101,444.3	2,558.7[20]

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
33	33	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Research and training in targeted and emerging areas of national importance is accelerated.	Percentage of projects demonstrating knowledge transfer in strategic areas.	50%	51%
	Number of students and fellows carrying out research in strategic areas.	2,500	2,631

Performance analysis and lessons learned

From the 2012 evaluation of the Strategic Projects program, 51% of industrial partners indicated that they had used the research results generated from the Strategic Project. Large firms (63%) used the results more frequently as compared to small firms (46%). Forty-eight percent of NSERC funding in strategic areas was used to support university students and fellows in 2013-14, or more than 2,600 individuals.

[20] Actual spending was higher than planned spending due to funds received in Budget 2013 for the Collaborative Health Research Projects.

Other highlights for the year include:

- In 2013-14, the Strategic Network Grants launched a third competition with the following target areas: Environmental Science and Technologies; Information and Communications Technologies; Manufacturing; and Natural Resources and Energy. These target areas align with the priorities outlined in the Government of Canada's S&T Strategy. 75 projects were awarded in the new target areas for a total of $12.2M (year one). These are in addition to the 162 on-going awards ($24.1 M) making a total of 237 strategic network grants ($36.3M).
- In 2013-14, sixteen NSERC projects were approved for funding for the Automotive Partnership Canada program, representing $28M in NSERC support and leveraging $21M in industry contributions.

Evaluation of the Collaborative Health Research Projects

The evaluation findings confirm the need for a program that funds collaborative research projects involving natural sciences or engineering and health sciences.

The evaluation found that the program has been effective in meeting its outcomes pertaining to collaborations between natural sciences and engineering and health researchers, multidisciplinary research, as well as training of Highly Qualified Personnel.

The evaluation also found that the program was effective at transferring knowledge. Most projects (72%) produced at least one peer-reviewed article (5 on average). One-quarter (25%) of researchers reported that they had filed a patent application or had issued or were in the process of issuing a license (14%) and 6% reported that their projects led to a spin-off company.

Sub-program 1.3.2: Industry-driven Collaborative Research and Development

Sub - program Description

This Sub-Program fosters collaborations between university researchers and industry, as well as other sectors, to develop and transfer new knowledge to Canadian-based organizations. It offers a range of industry-driven funding opportunities that stimulate innovation in the Canadian economy and encourage greater science and technology investment by the private sector. These partnership grants address real-world challenges that are relevant to industry, help build sustainable relationships between the two sectors, and connect people and skills. This program uses funding from the following transfer payment: Grants and Scholarships.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
137,602.2	136,493.8	-1,108.5[21]

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
46	47	1[22]

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Mutually beneficial collaborations between the private	Growth in total amount of research funds (cash and in-kind) leveraged from industrial partners.	2%	10.8% (see Figure 2.20)

[21] Lower spending a result of timing of grant payments based on competition results. Unused funds were distributed internally to other NSERC programs.

[22] The variance in FTEs reflects an increase in temporary staffing to facilitate higher demand during peak periods.

sector and researchers in universities, result in industrial or economic benefits to Canada.	Number of students and fellows solving industrial problems through collaboration.	2,500	3,963
	Percentage of industrial partners indicating satisfaction with research results.	75%	89%

Performance Analysis and Lessons Learned

Industry funding in NSERC's industry-driven programs continues to climb and has more than doubled over the past decade. The latest year-over-year increase in industry funding came in at 10.8% (see Figure 2.20). In 2013-14, fifty-four percent of NSERC funding in industry-driven program areas was used to support university students and fellows, or more than 3,900 individuals.

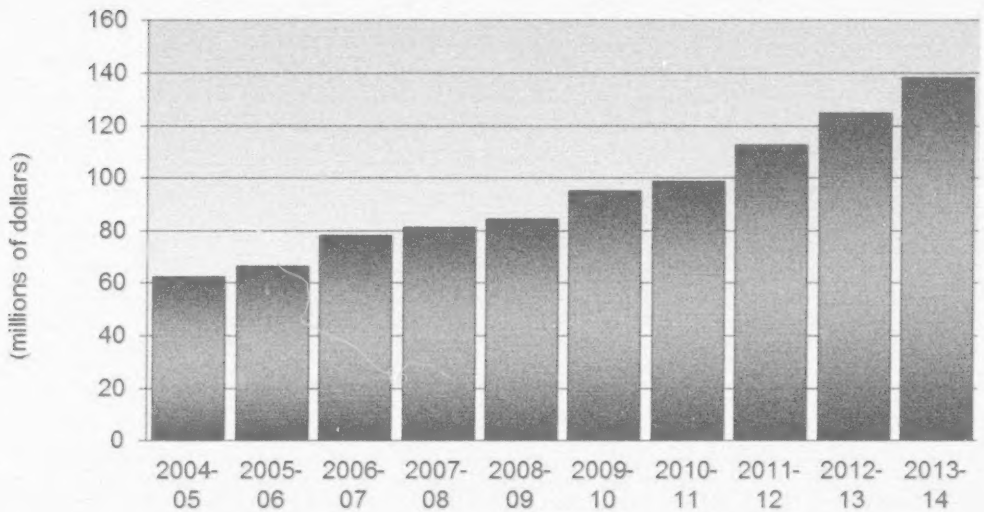
- The Industry-Driven program has continued to be in high demand with growth in its two primary funding opportunities: the Engage grant and the Collaborative Research and Development Grant. Since the introduction of Engage, a total of 3,391 projects have involved 2,380 unique companies, including over 1,550 that had never before participated in an NSERC program. Results reported by partnering companies at the conclusion of their projects indicate that: over 94% gained new knowledge/technology and describe the project as a success, 97% would recommend participating in an Engage Grant to other companies, and 70% intend to continue the collaboration.

- As of January 1, 2013, the reporting burden on the academic community and industrial partners has been reduced for ongoing Collaborative Research and Development projects; with most projects receiving funding for two years before a progress report and comments from the companies is required. This change, which received strong positive endorsement from the academic and industrial communities, will improve operational efficiency at NSERC.

- An international pilot initiative organized between NSERC and International Science and Technology Partnerships Canada was implemented in 2013- 14. Of the 10 projects initially approved by NSERC, eight projects received support through Collaborative Research and Development grants (four with Brazil, three with India, one with Israel). The NSERC investment totals $989,450 over two years. The two other awards were

cancelled due to the withdrawal of Canadian industrial partners from projects, and/or unsuccessful funding applications submitted to international partners.

Figure 2.20
Industrial Contributions to NSERC's Industry-Driven Programs



Source: NSERC database.

Energy-Efficient Mechanical Pulping
Working with Industry for Solutions

Global demand for renewable and sustainable wood pulp materials and products continues to increase. The long-term success of Canada's mechanical pulping industry, which includes newsprint, light-weight coated papers, and market pulp for export into tissue and paperboards, depends on managing the high electrical costs of operating the pulping process. In British Columbia alone, the industry consumes nearly 5 TWh/y, representing 10% of *BC Hydro*'s annual production. As such, there is a need for more renewable, sustainable and climate-friendly wood pulp products, and demand also extends globally. Working with industry leaders such as *Slave Lake Pulp Corporations* and *Aikawa Fiber Technologies*, Dr. James Olson and the team at UBC's Pulp and Paper Centre are finding ways to significantly reduce the energy consumed during current pulp production in B.C. mills. In transitioning towards energy reduction, they have developed new mechanical processes that use less energy to optimize the pulping process, as well as advanced sensors and controls. The goal is to realize energy savings of more than 1000 GWh per year – roughly enough to power 100,000 homes.

Sub-program 1.3.3: Networks of Centres of Excellence

Sub- program Description

This Sub-Program fosters partnerships among universities, industry, government and not-for-profit organizations. This program helps to harness the creativity and inventiveness of the best minds in various disciplines and sectors to find solutions to critical issues of importance to Canada using internationally competitive research, building on multi-sectoral partnerships; and, accelerating the use of multidisciplinary research results by organizations that can use them for economic, social, and environmental benefit. The program is jointly administered by the three federal granting agencies through the Network Centres of Excellence Secretariat. The networks supported through this program operate as virtual institutes to carry out research and knowledge/technology transfer activities among the participating organizations. The networks put in place well-defined strategies to transfer knowledge to users, ensuring that discoveries and technological advances are turned into social and economic benefits for all Canadians. The networks supported by this activity are designed to develop Canada's economy and improve the quality of life of Canadians. This program uses funding from the following transfer payments: Networks of Centres of Excellence and Business-Led Networks of Centres of Excellence

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
43,648.8	40,542.6	-3,106.2[23]

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
14	15	1[24]

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Strong linkages and partnerships between university, government and industry, and other users (NGOs), resulting in the exploitation of leading-edge research results with economic or societal benefits to Canada.	Demonstration of knowledge transfer activities (i.e., number of patents, licences, copyrights, number of new products or processes, policies influenced or created, health delivery influenced stemming from network research, business applications / proposals with a clear path to market).	100%	100%
	Ratio or partner contributions (cash	1	1.18

[23] Funding difference reflects money transfers due to competition results. Unspent funds caused by differences in planned vs actual spending were re-distributed internally to other NSERC programs.

[24] Variance in FTEs reflects an increase in temporary staffing to facilitate higher demand during peak periods

	in-kind) to NCE funding		
	Number of organizations involved in NCE research	2,049	2012

Performance Analysis and Lessons Learned

- A joint evaluation of the Networks of Centres of Excellence program and the Business-Led Networks of Centres of Excellence was conducted in 2013-14 and results are expected in winter 2014. A program audit of the Networks program was also undertaken in 2013-14. The audit identified several positive findings in areas linked to the core activities of the program, most noteworthy were findings related to the adjudication of applications and award payment. The program's peer review assessments were found to be consistent, well documented and decisions were supported by thorough justifications, highlighting the quality of the peer reviewer's work, as well as the diligence and professionalism of the current complement of staff.

- The second Networks Knowledge Mobilization competition was completed leading to the identification of two new networks: Serene (cybersecurity) and CellCAN (regenerative medicine). These new networks have each signed funding agreements and began receiving funding in March 2014.

- In 2013-14 four new Business Led Networks of Centres of Excellence were initiated. In Budget 2012, the Networks program was made permanent with a budget of $12 million/year. As part of the evaluation completed in 2011-2012, one of the recommendations encouraged expanding the opportunity for these existing Networks to compete for renewed funding. Following the Budget announcement, a renewal competition was launched in the summer of 2012 and concluded in November with the Quebec Consortium for Drug Discovery Network successfully renewing funding under the Business Led Networks Program. The remaining budget for the program was allocated through a new competition launched early in 2013 to fund up to four new Networks. The competition resulted in the following Business-Led-Networks receiving new funding: Green Aviation Research and Development Network; PreThera Research; Refined Manufacturing Acceleration Process and Ultra Deep Mining Network. The Business Led Networks have signed funding agreements and began receiving their grants in March 2014.

Evaluation of the Networks of Centres of Excellence

The review examined the relevance and performance of the NCE program including 15 of the 20 networks funded during the study period

The NCE program is well aligned with current government priorities and there is thus an ongoing role for the federal government to be involved in the program. The rationale for the program remains current, and there is a continued need for the program. The network approach has fostered highly engaged stakeholders such as universities companies, hospitals etc who have provided significant cash and in kind contributions which almost doubled the NCE program's grant expenditures over the period under review.

The review of expert panel reports confirmed that the approach of funding networks of researchers is highly effective in enhancing research, development, and innovation in areas targeted by the funded networks. This approach has facilitated multi-sectoral and international collaboration which has promoted multidisciplinary research.

The evaluation also mentioned that the Networks are developing Highly Qualified Personnel ready to join the workforce. Furthermore, the evaluation found that the networks resulted in the creation, extension or application of knowledge and technology and put in place the necessary mechanisms to transfer and use these research results and thus reach network researchers, partners and a broader audience, as appropriate.

Sub-program 1.3.4: Training in Industry

Sub- program Description

This Sub-Program supports students and recent graduates during short or longer term research internships in Canadian companies. The support allows them to gain Research and Development experience in industry and encourages them to consider careers in industry. Canadian companies benefit from the advanced research skills of these trainees and gain access

to new knowledge in their area of activity. The awards are leveraged by the host company, which contributes to the salary of the student or fellow. The program supports an increase in the number of highly qualified people in Canadian industry to strengthen Canadian innovation. This program uses funding from the following transfer payments: Industrial Research and Development Internship Program and Grants and Scholarships

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference (actual minus planned)
27,927.3	25,558.4	-2,368.8[25]

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
9	9	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Students and fellows gain research experience in an industrial setting	Percentage of Industrial R&D Fellows continuing to work in industry after their fellowship.	50%	68.9%
	Percentage of undergraduate students considering an industrial R&D career (after their USRA-I).	50%	51.1%
	Percentage of firms realizing benefits from internships.	75%	83%

[25] Difference reflects funds redistributed to other NSERC programs.

Performance Analysis and Lessons learned

A 2013 survey of Industrial R&D fellows seven years after their award indicates that 68.9% of fellows continue to work in industry. The retention of these fellows in industry is important to help support Canada's business R&D effort. The Undergraduate Student Research Award in Industry program is another important way NSERC attempts to stimulate industrial R&D interest. The most recent exit survey of USRA-I recipients of this award shows that 51.1% of the students are considering a career in industry after their education is completed. The 2013 evaluation of the Industrial R&D Internship program revealed that 83% of industrial partner supervisors indicated that the internship was effective in addressing the needs of the firm.

- In 2013 – 14, NSERC provided a total of $25.6M to the Training in Industry program that supported a range of students and fellows. The popularity of this program increased greatly in the past fiscal year. In 2013-14, the Industrial Undergraduate Student Research Awards received over 1,300 applications, an increase of 17% over the previous year. In addition, Budget 2013 stated that the Granting Councils will extend eligibility for their undergraduate industrial internships and scholarships to students enrolled in bachelor degree programs in colleges and polytechnics.

Evaluation of the Industrial Research and Development Internships

The evaluation found that there is a strong rationale for this program, given that Canada lags other developed nations in terms of industrial innovation and business investment in research and development (R&D) activities. The focus of the program is consistent with key strategies outlined in literature to promote industrial innovation, particularly with respect to facilitating collaboration and linkages between academia and industry, supporting skills development, and increasing access to funding.

The program has made significant progress in terms of its immediate and intermediate outcomes. The internships enabled interns to gain exposure to real-world business problems, and relevant industry experience. Furthermore, most businesses reported that the internships were effective in addressing their business needs.

The evaluation found that the internships facilitate further collaboration between industry and academia by strengthening existing or creating new relationships with the other party, as well as by identifying research issues or topics and increasing the focus on research relevant to business needs and issues.

Sub-program 1.3.5: Commercialization of Research

Sub- program Description

This Sub-Program supports the development of commercially promising technologies and promotes the transfer of knowledge and technologies to Canadian companies for commercialization. Strengthening Canada's record in commercialization is necessary to achieve business growth, job creation, and a stronger, more resilient economy. By means of grants awarded through competitive peer review processes, Natural Sciences and Engineering Research Council aims to support the development of pre-competitive technologies and to help build the capacity of Canadian universities and colleges to work with industry and fuel economic growth. Federal investments serve to leverage significant amounts of private funding. This program uses funding from the following transfer payments: Grants and Scholarships and the Centres of Excellence for Commercialization and Research.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
11,169.6	17,763.4	6,593.8[26]

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
4	4	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Pre-competitive development of promising technology and the promotion of its transfer to new or established Canadian companies is facilitated.	Percentage of centres in which technologies were commercially developed (e.g., creation of spin-offs, licensing revenue and/or agreements, venture capital funding).	100%	100%
	Percentage of projects resulting in intellectual property protection (patents, copyrights, trademarks, registered industrial designs).	10%	29.4%

Performance analysis and Lessons Learned

NSERC's commercialization initiatives enhance the capacity of Canadian universities and colleges to transfer knowledge and technology from academic research laboratories to Canadian companies, and to accelerate the pre-commercial development of promising innovations. In 2013-14, all of the Centres of Excellence for Commercialization and Research

[26] The variance between planned and actual spending relates to the program cycle, where funding amounts are determined by peer-review adjudication and funds are appropriated through the Supplementary Estimates during the year.

reported technology development resulting in commercial outcomes (e.g. spin-off firms, licensing revenue, venture capital funding). Furthermore, the percentage of Idea to Innovation projects that have resulted in commercial success, including the creation of new spin-off companies and licensing agreements, is 29.4%. This fraction will rise over the coming years, as it typically takes 3-5 years for commercial success to be observed from an Idea to Innovation funded-project.

- NSERC continues to promote the commercialization of research by improving technology transfer proposals through the Market Assessment option for the Idea to Innovation grant – which has now been available for three full years. The number of Market Assessment proposals reviewed by the Committee has increased from 26 in 2010-11 to 32 in 2013-14 and has greatly improved the success rate of these commercialization projects in achieving a full Idea to Innovation grant.

- In 2013-14 the Centres of Excellence for the Commercialization of Research program held a competition for additional funds for centres originally funded in the second program cohort in 2009. The competition placed an emphasis on evaluating each centre's progress, achievements and the viability of their business and sustainability plans. Three centres were awarded more than $22M to pursue their commercialization and sustainability activities. Additionally, 2013-14 saw the launch of the first program competition for new centres since 2010, with management, business and finance included as priority areas. After a letter of intent screening phase, 11 applicants were

A better and greener way to make microchips
GreenCentre Canada - (Center of Excellence for the Commercialization of Research)

GreenCentre Canada's hands-on approach to developing, de-risking and marketing university inventions has brought a breakthrough technology to market that will help microelectronics companies meet the insatiable demand for smaller, cheaper and faster devices. Developed at Carleton University, the technology uses a process called Atomic Layer Deposition to build nano-scale metal layers on a microchip. Not only does this overcome the problem of connecting ever smaller microchip circuit components with metal conductors, it will also enable large-scale manufacturing of microchips with less waste and lower power consumption. Two Canadian companies – Digital Specialty Chemicals and GreenCentre spin-off Precision Molecular Design – are the first on board to commercialize the technology.

invited to submit full applications for adjudication the following year.

Sub-program 1.3.6: College and Community Innovation

Sub- program Description

This Sub-Program increases the capacity of colleges and polytechnics to support innovation at the community and/or regional level. The program design and funding stimulate new partnerships and increased entrepreneurship and assist colleges and polytechnics to take risks and be nimble in developing new ways of working with local businesses and industries to spur innovation and economic growth. This program uses funding from the following transfer payments: College and Community Innovation Program, College-University Idea to Innovation, and the Industrial Research Chairs for colleges.

Budgetary Financial Resources (thousands of dollars)

2013–14 Planned Spending	2013–14 Actual Spending	2013–14 Difference
38,027.9	48,259.4	10,231.5[27]

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference
13	13	0

Performance Results

Expected Results	Performance Indicators	Targets	Actual Results
Increased capacity of colleges to support innovation at the community and/or regional level.	Growth in number of partnerships with companies and other organizations.	5%	4.7% (see Figure 2.21)
	Percentage of companies indicating development of new and/or improved	25%	69%

[27] Actual spending was higher than planned spending due to funds received in Budget 2013.

	products, services, and/or processes.		

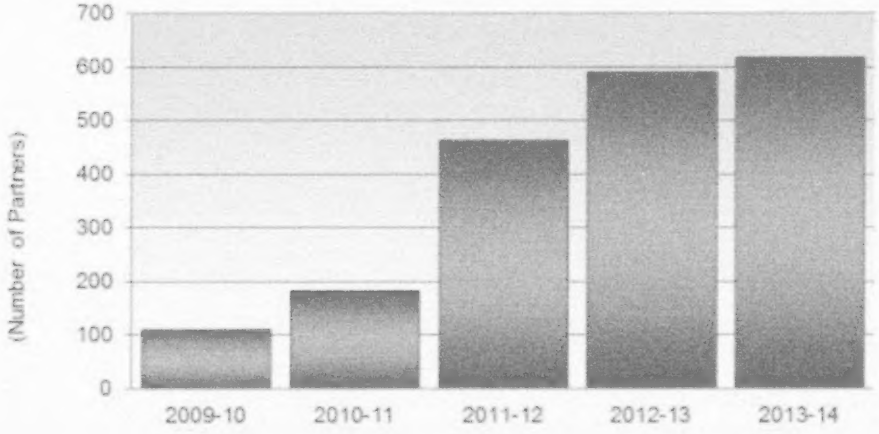
Performance Analysis and Lessons Learned

The number of partners participating in College program grants has grown dramatically over the past five years (see Figure 2.21) and the latest year-over-year increase was 4.7%. More than two-thirds (69%) of companies had also experienced impacts on at least one aspect of their R&D capacity (i.e., their ability to introduce new or substantially improved products, processes or services to market; their ability to attract investments or their ability to make research investments).

Other highlights include:

- Following Federal Budget increases to the College and Community Innovation program in 2008, 2010, and 2011, Budget 2013 allocated an additional $12M annually to the Program. These funds resulted in new competitions for the Technology Access Centres Grants and Applied Research Tools and Instruments Grants and additional awards in the Innovation Enhancement Grants. Out of these competitions nine new grants for the Five Year Innovation Enhancement Grants ($2.3M/5 years) were awarded in 2013-14 in addition to three new full ($1.75M/5 years) and three incremental Technology Access Centres Grants ($500K/5 years).

Figure 2.21
Number of industry, non-profit, and government partners on NSERC's College Programs



Source: NSERC database. Excludes colleges and universities.

Internal Services

Description

Internal Services are groups of related activities and resources that are administered to support the needs of programs and other corporate obligations of an organization. These groups are: Management and Oversight Services; Communications Services; Legal Services; Human Resources Management Services; Financial Management Services; Information Management Services; Information Technology Services; Real Property Services; Materiel Services; Acquisition Services; and Other Administrative Services. Internal Services include only those activities and resources that apply across an organization and not to those provided specifically to a program.

Budgetary Financial Resources (thousands of dollars)

2013–14 Main Estimates	2013–14 Planned Spending	2013–14 Total Authorities Available for Use	2013–14 Actual Spending (authorities used)	2013–14 Difference (actual minus planned)
23,735.2	23,735.2	25,948.9	24,096.2	361.0

Human Resources (FTEs)

2013–14 Planned	2013–14 Actual	2013–14 Difference (actual minus planned)
175	175	0

Performance Analysis and Lessons Learned

- In 2013-14, NSERC introduced measures to strengthen financial accountabilities and improve its business processes and systems. NSERC has upgraded the departmental financial management system which will permit the agency to leverage new interoperability between systems and allows for enhanced reporting of financial information. The agency has also implemented a monitoring strategy for internal controls over financial reporting and a modernized financial monitoring framework which includes a long term monitoring plan of the institutions that receive grant funding.

- In May 2013, NSERCs Discovery Grant and Subatomic Physics, Notice of Intent went live on the Research Portal. The Agency received over 3,500 Notices of Intent. In August,

the full application for this program was launched re-using key data elements from the notices (eliminating redundancy in data entry between forms). At the close of the competition, 3,244 applications were received and 3,572 Canadian Common CV's were uploaded.

- In September 2013, the Research Portal launched the Tri-Agency Harmonized form for the Canada Graduate Scholarship – Masters providing students with a common location and a single data set for application submission. The Research Portal also delivered functionality to allow Scholarship Liaison Officers to manage quotas, allocations and make offers to students directly through the Portal. Over 7,300 applications were submitted, approximately 2,800 of those applications targeted NSERC as their field of research.

Section III: Supplementary Information

Financial Statements Highlights

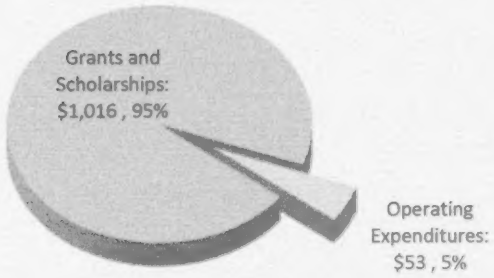
Natural Sciences and Engineering Research Council
Condensed Statement of Operations and Departmental Net Financial Position (audited)
For the Year Ended March 31, 2014
($ thousands)

	2013–14 Planned Results	2013–14 Actual	2012–13 Actual	Difference (2013–14 actual minus 2013–14 planned)	Difference (2013–14 actual minus 2012–13 actual)
Total expenses	1,057,469	1,068,357	1,073,115	10,888	(4,758)
Total revenues	-	164	-	164	164
Net cost of operations before government funding and transfers	1,057,469	1,068,193	1,073,115	10,724	(4,922)
Departmental net financial position	(292)	3,412	1,343	3,704	2,069

The pie chart below displays the allocation of 2013-14 expenses by the Natural Sciences and Engineering Research Council of Canada (NSERC) for grants and scholarships and for operating expenses. In 2013-14 Grants and scholarships expenditures were 1,016 million dollars, or 95% of total NSERC expenses. Operating expenditures were 53 million dollars, or 5% of total NSERC expenses.

As illustrated in the pie chart, NSERC allocates 95% of its available budget directly to researchers and institutions across Canada to support university and college-based research and training in the natural sciences and engineering.

Allocation of NSERC Expenses
Between Grants and Operating Expenses, 2013-14
($ millions and %)



Natural Sciences and Engineering Research Council
Condensed Statement of Financial Position (audited)
As at March 31, 2014
($ thousands)

	2013–14	2012–13	Difference (2013–14 minus 2012–13)
Total net liabilities	6,982	7,433	(451)
Total net financial assets	3,949	4,045	(96)
Departmental net debt	3,033	3,388	(355)
Total non-financial assets	6,445	4,731	1,714
Departmental net financial position	3,412	1,343	2,069

The increase of $2.1 million in the departmental net financial position is mainly due to an increase of $1.9 million in tangible capital assets, in addition to a decrease of $0.5 million in total net liabilities due to a reduction in accounts payable and employee future benefits.

Financial Statements

Links to financial statements are found on NSERC's website[viii]:

Supplementary Information Tables

The supplementary information tables listed in the *2013–14 Departmental Performance Report* can be found on the NSERC's website[ix].

- Details on Transfer Payment Programs;
- Internal Audits and Evaluations;
- Departmental Sustainable Development Strategy;

Tax Expenditures and Evaluations

The tax system can be used to achieve public policy objectives through the application of special measures such as low tax rates, exemptions, deductions, deferrals and credits. The Department of Finance Canada publishes cost estimates and projections for these measures annually in the *Tax Expenditures and Evaluations*[x] publication. The tax measures presented in the *Tax Expenditures and Evaluations* publication are the sole responsibility of the Minister of Finance.

Section IV: Organizational Contact Information

For further information about this report, please contact:

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Appendix: Definitions

appropriation: Any authority of Parliament to pay money out of the Consolidated Revenue Fund.

budgetary expenditures: Include operating and capital expenditures; transfer payments to other levels of government, organizations or individuals; and payments to Crown corporations.

Departmental Performance Report: Reports on an appropriated organization's actual accomplishments against the plans, priorities and expected results set out in the corresponding Reports on Plans and Priorities. These reports are tabled in Parliament in the fall.

full-time equivalent: Is a measure of the extent to which an employee represents a full person-year charge against a departmental budget. Full-time equivalents are calculated as a ratio of assigned hours of work to scheduled hours of work. Scheduled hours of work are set out in collective agreements.

Government of Canada outcomes: A set of 16 high-level objectives defined for the government as a whole, grouped in four spending areas: economic affairs, social affairs, international affairs and government affairs.

Management, Resources and Results Structure: A comprehensive framework that consists of an organization's inventory of programs, resources, results, performance indicators and governance information. Programs and results are depicted in their hierarchical relationship to each other and to the Strategic Outcome(s) to which they contribute. The Management, Resources and Results Structure is developed from the Program Alignment Architecture.

non-budgetary expenditures: Include net outlays and receipts related to loans, investments and advances, which change the composition of the financial assets of the Government of Canada.

performance: What an organization did with its resources to achieve its results, how well those results compare to what the organization intended to achieve and how well lessons learned have been identified.

performance indicator: A qualitative or quantitative means of measuring an output or outcome, with the intention of gauging the performance of an organization, program, policy or initiative respecting expected results.

performance reporting: The process of communicating evidence-based performance information. Performance reporting supports decision making, accountability and transparency.

planned spending: For Reports on Plans and Priorities (RPPs) and Departmental Performance Reports (DPRs), planned spending refers to those amounts that receive Treasury Board approval by February 1. Therefore, planned spending may include amounts incremental to planned expenditures presented in the Main Estimates.

A department is expected to be aware of the authorities that it has sought and received. The determination of planned spending is a departmental responsibility, and departments must be able to defend the expenditure and accrual numbers presented in their RPPs and DPRs.

plans: The articulation of strategic choices, which provides information on how an organization intends to achieve its priorities and associated results. Generally a plan will explain the logic behind the strategies chosen and tend to focus on actions that lead up to the expected result.

priorities: Plans or projects that an organization has chosen to focus and report on during the planning period. Priorities represent the things that are most important or what must be done first to support the achievement of the desired Strategic Outcome(s).

program: A group of related resource inputs and activities that are managed to meet specific needs and to achieve intended results and that are treated as a budgetary unit.

results: An external consequence attributed, in part, to an organization, policy, program or initiative. Results are not within the control of a single organization, policy, program or initiative; instead they are within the area of the organization's influence.

Program Alignment Architecture: A structured inventory of an organization's programs depicting the hierarchical relationship between programs and the Strategic Outcome(s) to which they contribute.

Report on Plans and Priorities: Provides information on the plans and expected performance of appropriated organizations over a three-year period. These reports are tabled in Parliament each spring.

Strategic Outcome: A long-term and enduring benefit to Canadians that is linked to the organization's mandate, vision and core functions.

sunset program: A time-limited program that does not have an ongoing funding and policy authority. When the program is set to expire, a decision must be made whether to continue the program. In the case of a renewal, the decision specifies the scope, funding level and duration.

target: A measurable performance or success level that an organization, program or initiative plans to achieve within a specified time period. Targets can be either quantitative or qualitative.

whole-of-government framework: Maps the financial contributions of federal organizations receiving appropriations by aligning their Programs to a set of 16 government-wide, high-level outcome areas, grouped under four spending areas.

Endnotes

[i] Natural Sciences and Engineering Research Act http://laws.justice.gc.ca/eng/acts/N-21/page-1.html#docCont

[ii] Summary of common themes raised in the open access online consultation http://www.nserc-crsng.gc.ca/NSERC-CRSNG/policies-politiques/OpenAccess-LibreAcces_eng.asp

[iii] Full report on the online consultation on the draft Tri-Agency Open Access Policy http://www.nserc-crsng.gc.ca/_doc/NSERC-CRSNG/NSERC-SSHRC-OpenAccess_e.pdf

[iv] Audit of the Networks of Centres of Excellence Program http://www.nserc-crsng.gc.ca/_doc/Reports-Rapports/Audits-Verifications/AuditNCEProgram_e.pdf

v. Whole-of-government framework, http://www.tbs-sct.gc.ca/ppg-cpr/frame-cadre-eng.aspx

vi. *Public Accounts of Canada 2014*, http://www.tpsgc-pwgsc.gc.ca/recgen/cpc-pac/index-eng.html

[vii] Luda Diatchenko Canada Excellence Research Chair in Human Pain Genetics http://www.cerc.gc.ca/chairholders-titulaires/diatchenko-eng.aspx

viii Financial Statements http://www.nserc-crsng.gc.ca/NSERC-CRSNG/Reports-Rapports/plans-plans_eng.asp

[ix] Supplementary Tables http://www.nserc-crsng.gc.ca/NSERC-CRSNG/Reports-Rapports/plans-plans_eng.asp

x. *Tax Expenditures and Evaluations* publication, http://www.fin.gc.ca/purl/taxexp-eng.asp